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# Regulating for the long term:

Supporting  
long-term investment

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# Summary

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Ofwat has set out a strategic objective for the next price review to have a long-term focus. Looking towards that long-term future it is clear that the sector requires substantial private investment – potentially it will require the doubling of what has already been invested. The National Infrastructure Commission (NIC) notes in its report that the impact of not investing could be around £40bn over the next 30 years<sup>1</sup>.

This capital will need to be obtained in a competitive international context, during a time of macroeconomic uncertainty and increasing operational risk and when most of the sector is failing to earn its base return.

If the sector fails to attract that investment or the cost of that investment increases, then the detrimental impact on consumers and the environment would be very significant.

To ensure that investment is attracted when it is needed and at reasonable cost to customers we need greater stability and predictability in the risk and return balance going forward – investors need to be confident that they can earn a fair and competitive return for their investment over the long term.

This document sets out some proposals for how that stability and predictability could be better maintained.

We welcome feedback on our proposals. Please email [haveyoursay@nwl.co.uk](mailto:haveyoursay@nwl.co.uk) to share your views.

## We propose a series of actions including:

- 1. Developing a clear and consistent methodology to set allowed returns that can be applied over multiple price reviews.** A more stable and predictable approach to setting the allowed returns to equity shareholders over different price control periods would benefit customers and investors. A consistent and robust methodology would stop the downward ‘regulatory escalator’ of continually falling returns over successive price reviews that are driven by questionable methodological changes rather than external market movements.
- 2. Drawing on the precedent set by the Competition and Markets Authority (CMA).** The best way to achieve this consistency and predictability would be to follow the recent precedent set by the CMA decisions in the water appeals following the last price review. These represent an independent expert assessment of the allowed returns from what was the longest and most detailed review of returns in the water sector since privatisation.
- 3. Using long-term information to calculate allowed returns.** For any approach to be truly ‘long term focused’ the parameters of the Capital Asset Pricing Model (CAPM) used to calculate the allowed return need to, both individually and collectively, reflect that long-term focus and not be based entirely on short-term information.
- 4. Using a wide range of evidence to cross-check the level of allowed return.** More information should be considered than simply focusing on short-term Market-to-Asset Ratio evidence.
- 5. Setting the overall package of risk and return in the price control with due consideration of risks at a company level.** This assessment of risks should be based on a structured and holistic approach that faithfully captures the risks faced by the regulated business.

<sup>1</sup>See ‘Preparing for a drier future England’s water infrastructure needs’, NIC, April 2018.

# The context and future challenges

In its methodology for PR24 Ofwat has proposed that companies' business plans should reflect a strong long-term focus.

Since Ofwat's 2019 price review (PR19), companies and governments have set a number of long-term targets and objectives for the sector, with further targets to be set under the Environment Act (2021). To help make the right decisions for the long term, companies should set out their five-year business plans in the context of a 25-year long-term delivery strategy<sup>2</sup>.

This reflects Ofwat's statutory duties to protect the interests of customers including 'current and future customers', to promote resilience and to ensure that companies can fulfil their functions over the long term<sup>3</sup>. It may also reflect some of the learnings from the last price review, where some considered that there was too strong a focus on short-term bill reductions<sup>4</sup> at the expense of investment.

This is also in line with the Government's strategic priorities for Ofwat:

**The government has committed to taking a long-term approach to investment, recognising that a system that works in the enduring interests of consumers does not simply mean lower prices in the short-term at the expense of future generations. Ofwat should promote efficient investment, ensuring it is made in a way that secures long-term resilience and protects and enhances the environment, whilst delivering value for money for customers, society and the environment over the long-term.**

**We expect Ofwat to provide the regulatory conditions to foster a culture which gives proper consideration to the long-term and balances the interests of current and future customers fairly<sup>5</sup>.**

We support Ofwat's increased focus on the long-term. This is entirely appropriate in a sector which provides essential services to customers through a complex network of assets many of which have very long lives. Indeed, this long-term focus is also reflected in the investment horizon for the sector, which is 20-25 years on average<sup>6</sup>.

As we look to that long-term, under any scenario or future state of the world, there is a clear need for substantial new capital investment. For example:

- Work by the NIC suggests that £21bn of new investment would be required to address the supply demand imbalance in water resources<sup>7</sup>;
- Water UK's work suggests that achieving Net Zero operational emissions would require some £2-4bn of investment<sup>8</sup>; and
- The recent Defra consultation on measures to reduce storm overflows envisages some £54bn of investment by 2050 will be required across England to address storm overflows<sup>9</sup>.

<sup>2</sup>See 'PR24 and beyond: Long-term delivery strategies and common reference scenarios', Ofwat, November 2021, p.3. <sup>3</sup>See: ofwat.gov.uk/about-us/our-duties/ <sup>4</sup>For example the EAC 2021 report on Water quality in rivers raised this concern and this was raised by the disputing companies in the PR19 CMA redeterminations where the CMA did increase both levels of investment and the allowed return <sup>5</sup>See 'February 2022: The government's strategic priorities to Ofwat', Defra. <sup>6</sup>Based on Northumbrian Water Limited analysis of APR data on industry average debt tenor. <sup>7</sup>See 'Preparing for a drier future England's water infrastructure needs', NIC, April 2018, p.4. <sup>8</sup>See 'Net Zero 2030 routemap - Summary for Policymakers', Water UK, 2020, p.7. <sup>9</sup>See 'Consultation on the Government's Storm Overflows Discharge Reduction Plan', Defra, March 2022.

Without that investment the detriment to consumers and the environment would be significant<sup>10</sup>. For example:

- The NIC report notes that the impact of not investing could be around £40bn over the next 30 years. In particular, a lack of investment now will result in higher cost to consumers in the future. This is both inefficient and creates issues of intergenerational fairness.
- Investment is required to improve or maintain service. For example, additional capacity is required to mitigate the risk of shortfalls and avoid disrupting the provision of essential services to customers, interruptions to water supply and putting the environment under greater pressure from water abstraction<sup>11</sup>.

The Competition and Markets Authority (CMA) has recognized that in the face of climate change investment in new and existing infrastructure is key to maintaining resilient services for customers<sup>12</sup>.

The government considers that the right level of investment is needed to maintain the quality of the water environment and guarantee a resilient water sector<sup>13</sup>.

As a result, we agree that PR24 should have a strong focus on supporting the financing of long term investment.

The figures cited above are set against an industry regulatory capital value (RCV) of about £84.1bn<sup>14</sup>, implying a potential doubling of the investment since privatisation or more. This will require the sector to attract new capital in a competitive and international market for that investment, with much of that needed in the next five-year period given the desire for rapid progress, for example, on climate change and reducing storm overflows.

There are several factors which are pertinent to the ability of a water company to access the capital required for these investments.

## Inherent characteristics of water companies that imply long-term financing challenges:

- **Cashflow-negative financial profile:** regulated utilities are required continuously to make significant capital investments, typically greater than for an average company in the financial market. Water companies are unusual among most other corporates in that they are, and have been since privatisation, continuously cashflow-negative, resulting from the capital-intensive nature of the sector. This means that their cash outflows exceed cash inflows in any given year, and that private investors provide capital on the assumption that either this will reverse in the future or new investors will always be available to roll forward companies' financial obligations.
- **Long lived assets and corresponding need for long term financing:** the assets in which water companies invest are very long-lived. At the same time, raising longer-term financing to match the useful lives of these assets, which ensures asset-liability matching, limits companies' financial exposure and refinancing risk and hence secures provisions of services for consumers.
- **Sustained requirements of debt finance:** water companies have a low cost of capital, which benefits consumers through lower prices. This is in part due to companies' ability to raise significant amounts of debt in line with their high debt requirements. The latter, in turn, depends on the regulated company's credit rating, financial profile, and the predictability and stability of the regulatory regime.

<sup>10</sup>This is for example why regulators including Ofwat at PR04, PR09 and PR14 as well as the CMA have tended to 'aim-up' in setting the allowed cost of capital as, given the essential services companies provide, the detriment to consumers and the environment is greater if the return is set too low than if it is set too high, see for example the CMA's redetermination from the PR19 water appeals at: 'Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations Final Report', CMA, March 2021. <sup>11</sup>Meeting our future water needs: a national framework for water resources', Environment Agency, March 2002, p.7. <sup>12</sup>See 'Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations Final Report', CMA, March 2021. <sup>13</sup>See 'February 2022: The government's strategic priorities to Ofwat', Defra.

## Future challenges and risks

### Future interest rate pathways create risks across multiple price controls:

- The current financial environment is much more uncertain and volatile following the significant disruption of the Covid-19 pandemic period and in the context of significant market uncertainty.
- The decline in yields since 2010 has been markedly more pronounced at the shorter end of the yield curve (i.e. the yield curve has become upward sloping). The long-term financing that water companies have relied upon in the past has become relatively more expensive and the yields on short-term maturities, which have fallen by disproportionately more, have influenced the cost of debt allowances. This creates a wedge between longer-maturity embedded debt costs and the cost of debt allowance.

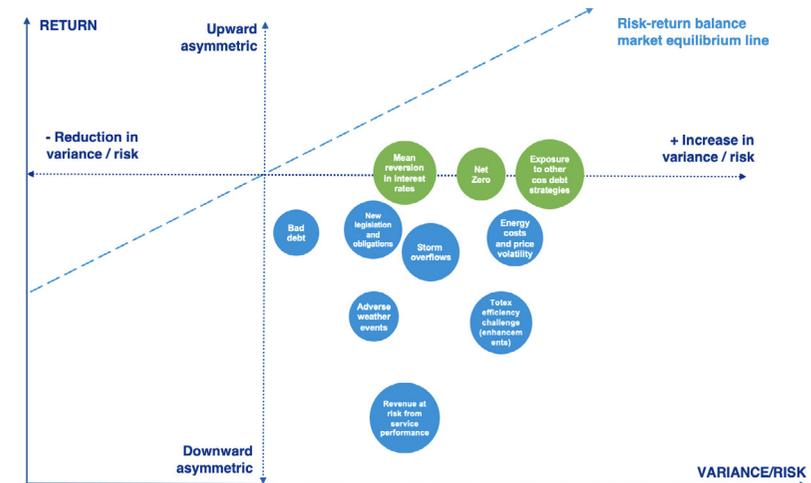
### Recent regulatory settlements demonstrate higher operational risks:

- Water companies are operating in an increasingly high-risk environment and there is increasing value at risk arising from a combination of tough regulation

and very stretching operational targets. This increase in risk exposure has been acknowledged by Ofwat<sup>15</sup>. We have also seen material changes to the allocation of risk between companies and customers with a much greater, unpriced, allocation to companies.

- The service requirements on water companies are also increasing over time. Where there is a disconnect between the service level required and the allowed costs as there has been recently this increases the operational risk to companies.
- These risk factors are set out on an illustrative basis on the mean-variance framework in Figure 1 in terms of their expected impact on risk (horizontal axis) and returns (vertical axis). In particular, the framework captures risk factors whose (1) probability of occurrence, (2) magnitude of impact if crystallised and (3) degree of asymmetry are increasing over time, in isolation or in combination. The relative size of the circles corresponds to the magnitude of the illustrative impact.

Figure 1: Drivers of changes to risk allocation and exposure



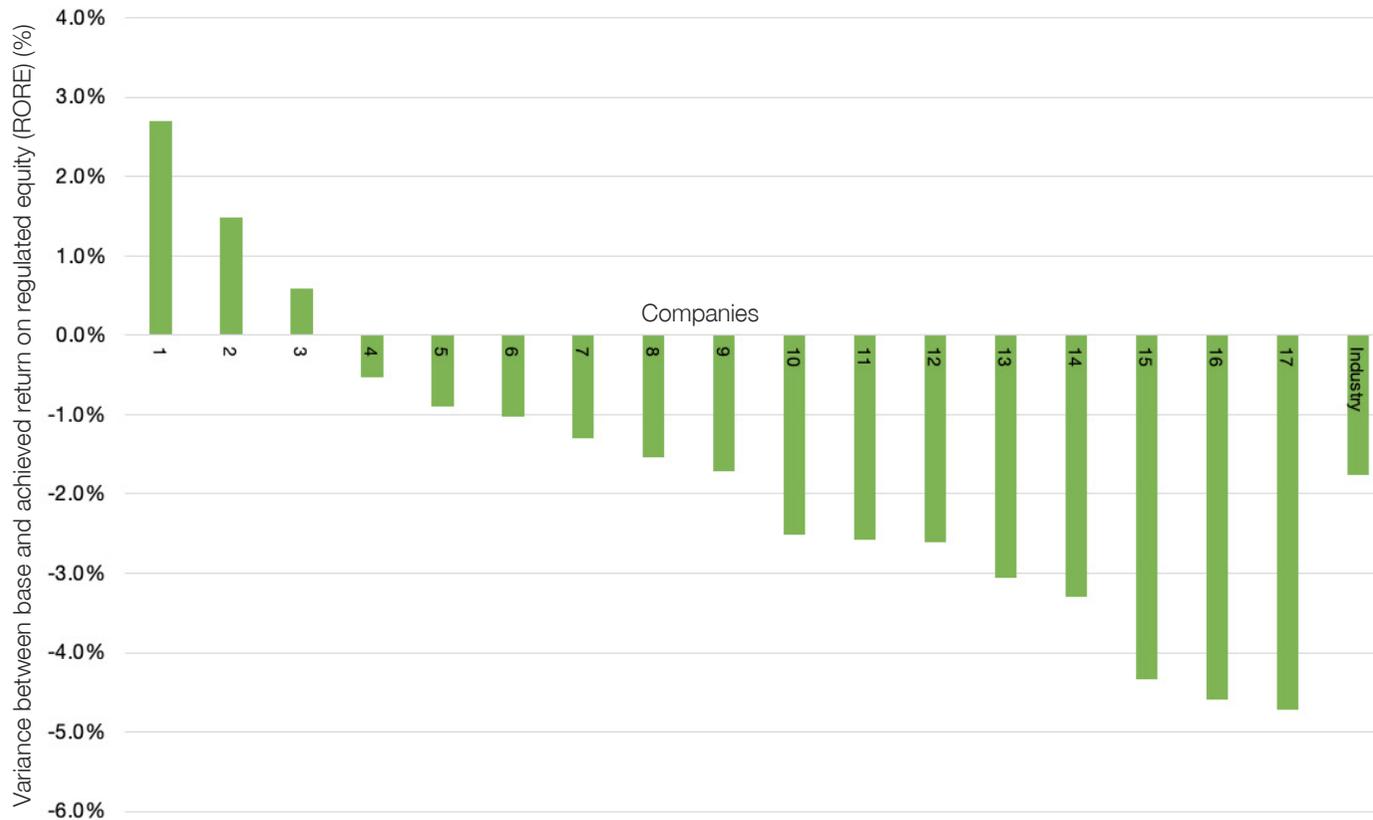
Source: NWL analysis of PR19 and potential PR24 changes.

For the risk factors along the positive horizontal axis (highlighted green), the probability of occurrence is increasing but the risk is symmetric as companies are equally exposed to both the potential upside and downside. So for example moving to Net Zero and addressing climate change risks should be symmetrical where companies can invest to meet those risks and receive a return on investment added to the asset base. However, risk factors in the bottom right quadrant are increasing but also imply more downside than upside return. These include for example

adverse or extreme weather events, which expose companies to significant service performance penalties on the downside without any offsetting upside opportunity. The fact that more than 80% of the sector are failing to earn their base allowed return<sup>16</sup> provides further evidence of the increasingly challenging operational environment. There are a wide range of performance outcomes observed in the sector, reaffirming the conclusion that the revenue and costs at risk has been increasing materially over time, in contrast to the step-change reductions applied to allowed returns.

<sup>15</sup>For example, Ofwat recognises that 'The combined effects of a more uncertain future (for example, driven by less predictable weather and the effects of climate change) and revenue at risk from service performance...may indicate a greater role for equity in order to provide a buffer against supply-side or demand-side shocks'. p.43 <sup>16</sup>During AMP 6 over half of the companies (9/17) failed to earn their base allowed return on regulated equity. In 2020/21 this figure grew to 14/17 companies (over 80%) with three companies having negative RoRE. See: <https://www.ofwat.gov.uk/regulated-companies/resilience-in-the-round/monitoring-financial-resilience/>

Figure 2: Most companies did not achieve base returns in 2020-21 - Industry RORE Variances to Base 2020-21



Source: NWL analysis of 'Monitoring Financial Resilience Report Year ended 31 March 2021', Ofwat, December 2021, p.18.

It is clear from figure 2 that water companies are exposed to a challenging operational and macroeconomic environment.

In PR19, Ofwat addressed the outperformance of companies driven by financing gains derived from the low cost of new debt by introducing indexation for debt, leaving most of the industry in underperformance in 2020-21. This impact on returns has been reinforced by the tougher performance targets and the cost gap in PR19. A significant uplift in investment in this uncertain context might be challenging to achieve, particularly where regulation is not tailored to the inherent characteristics of these companies.

# The role of regulation in supporting investment

## The regulatory framework underpins all investment in the sector.

In this context the Government has recognised that:

**“The predictability of the price control process is fundamental to maintaining a stable regulatory environment for investment... Additionally, a key element to encouraging investment is providing a stable and predictable environment for investors and consumers...”<sup>17</sup>”**

Investors entering the water sector do so with an investment horizon of around 20 years. The UK water sector is fortunate in attracting some of the most long-term investors in the world but critically requires support in the form of (1) consistent and stable regulatory methodologies over time and (2) regulation that is suitably long-term focused, or that avoids attaching excessive weight to spot market information that is inconsistent with the long investment horizon. This should include both the approach used to set allowed returns and allocate risk between parties.

Setting an appropriately long-term, evidence-based allowance for the weighted average cost of capital (WACC) on a consistent basis in each price review is important to retain and attract investment in the sector. This has been recognised by the CMA who noted in its Final Determination (FD) for Bristol Water at PR14 that:

**“An important part of this analysis [of the allowed return] is the application of a consistent approach to setting the assumptions which form the basis of the calculation of the cost of capital. Both debt and equity investors make long-term financing decisions, including debt financing of up to 30 years’ maturity. This reflects investors’ expectations not just in respect of the immediate regulatory period, but of a consistent approach over the longer term...the financing environment is influenced by the stable approach to the estimation of the cost of capital, applied by both sector regulators and also in previous CC/ CMA decisions<sup>18</sup>.”**

It is important to determine the right investment horizon and then calculate the capital asset pricing model (CAPM) using the estimated horizon on a consistent basis over time. The underlying parameters should, as far as possible, be estimated in a way that is consistent with the chosen horizon, as otherwise the WACC estimate is not a true expected return over the chosen time horizon.

<sup>17</sup>‘Economic Regulation Policy Paper’, BEIS, January 2022. <sup>18</sup>‘Bristol Water plc, A reference under section 12(3)(a) of the Water Industry Act 1991’, CMA, October 2015. (Referred to as Bristol FD in future footnotes.), paragraphs 10.6 to 10.7.

Given that in regulated sectors the appropriate investment horizon is recognised to be long, a forward-looking WACC over that same long-run horizon is required to facilitate investment. The CMA noted at PR19 that:

**“In addition, we note the very long-life assets and long-horizon investment decisions that are likely to be based on our cost of capital estimates. As a result, we suggest that a 20-year investment horizon would closely match the reality of decision-making within the sector and so use gilt and other market data at or close to 20-year maturities.”**

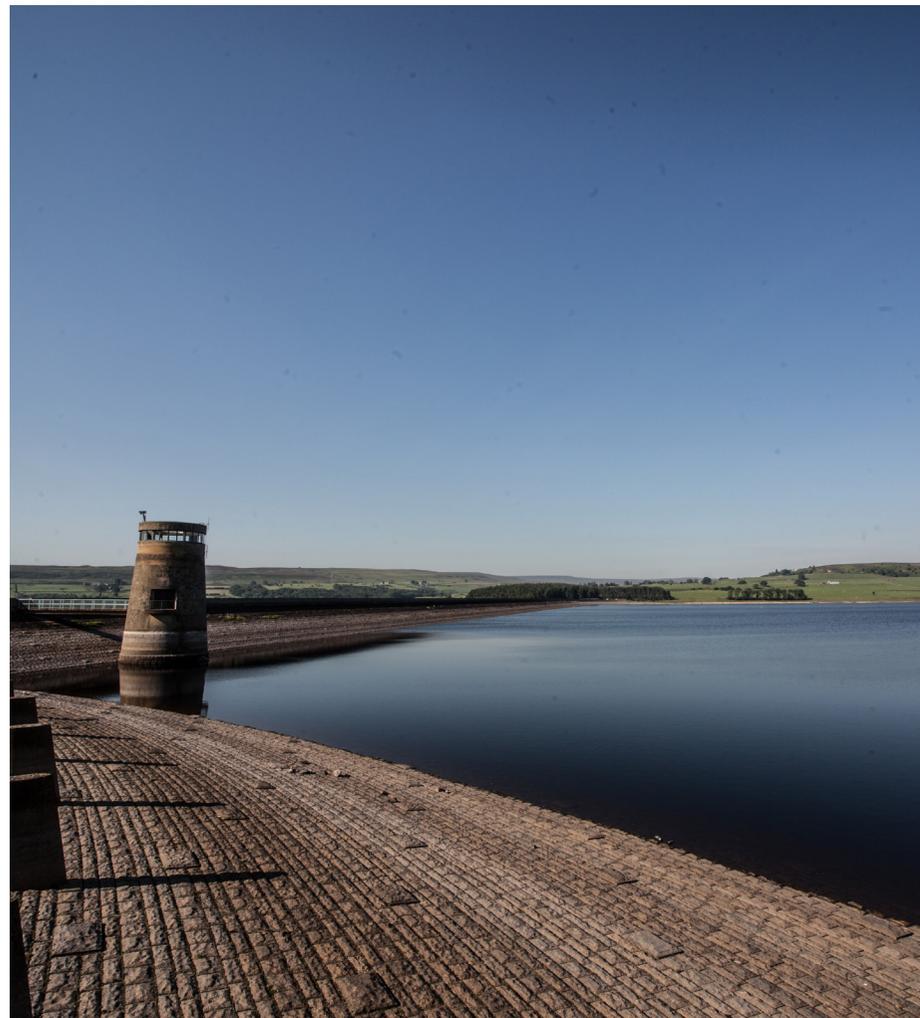
Reducing allowed returns by adopting an approach that breaks significantly from precedent and/or locks in short-term market movements into the allowed WACC could negatively affect investor confidence. Such changes will affect the certainty for investors and will be priced into the cost of that investment, which will ultimately be paid for by customers.

At PR19 the CMA was explicit in its recognition that the current cost of capital methodologies can have a direct impact on the level of future investment and the future costs to customers.

**“There is... uncertainty around the optimal level of investment that may be required, now and in the future, but with a material probability that companies will need to design and invest in an enhanced capital programme in the coming periods...**

**If investors do not expect to be fully compensated for future investments over their life, then they may be unwilling to invest in the future to meet these requirements...**

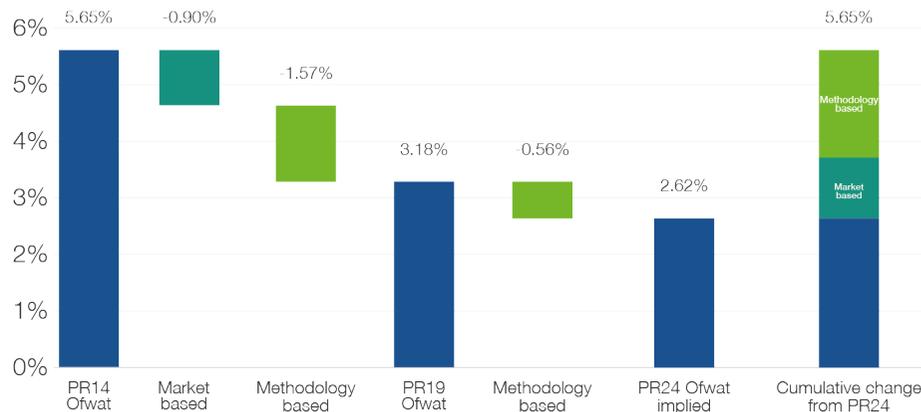
**[Investors may] choose to exit the sector or are unwilling to put in further capital at the allowed WACC, resulting in a higher cost of capital from new investors who are willing to put money into the sector, or a need to pay a premium in future price controls.”**



## How has the regulatory framework evolved in this area?

Recent price controls – including the emerging methodology for PR24 – have seen material changes in the approach to risk and return which favour short-term outcomes (i.e. bill reductions) that may not be supported by customers<sup>19</sup>.

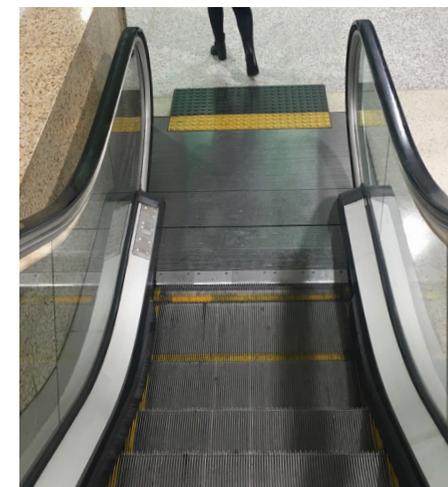
**Figure 3: The regulatory escalator - evolution of Cost of Equity since PR14 due to changes in the market vs changes in Ofwat methodology**



Source: NWL analysis of previous price determinations and market information

Across the last two price determinations most of the movement in the allowed return has been driven by changes to the methodology applied to estimate each of the parameters in setting the Cost of Equity (CoE).

Furthermore, for PR24 Ofwat is proposing methodologies that were explicitly considered by the CMA – either as underpinning the PR19 FD or as alternatives proposed by Ofwat during the appeal – and rejected. Those proposals which are new relative to PR19 FD are downside only and will, if adopted into the PR24 methodology, reduce cost of equity irrespective of movements in the market rates, which are expected to increase materially ahead of PR24.



We are fundamentally concerned not just with the level of change in the past but also with the nature of some of those changes, which have increasingly driven a greater focus on spot market information away from the long-term 'through the cycle' approach that Ofwat's stated objectives for PR24 are focused on.

The table on the following page explains some of these instances for the core CoE parameters under the CAPM, focused on changes from PR14 to PR19.

<sup>19</sup>In 'Customer spotlight - People's views and experiences of water', A joint report from CCW and Ofwat, April 2022, keeping bills low was only ranked 7th of 10 customer priorities.

**Table 1: Evolution of CoE parameters from PR14-PR19**

Parameter	Changes through PR14-PR19	Implications for long term investment
Risk Free Rate (RFR)	<p>At PR19 Ofwat set the RFR based on 1-month average yield on 15-year (15Y) index-linked gilts (ILGs), uplifted by the expected increase in rates implied by the prevailing forward curve.</p> <p>The PR14 point estimate for the RFR was based on the yield on 15-20Y ILGs, uplifted for the forward rate adjustment based on 10Y nominal forward rates. This estimate was not based on spot data:</p> <ul style="list-style-type: none"> <li>• By using the nominal forward rate – which was materially higher than the real one – Ofwat arrived at a higher RFR than implied by the spot ILG rate.</li> <li>• The estimate was also cross checked against ten-year average of yields on ten-year ILGs.</li> </ul>	<p>The use of current market yields, combined with the very short-term average and no cross check against historical averages, introduces significant volatility into the estimate of allowed returns and inconsistency with the long-term investment horizon adopted for WACC estimation.</p> <p>In addition to undermining regulatory stability over time, in the absence of indexation, such an approach risks underestimating the RFR for long-term investment as it does not include any allowance for mean-reversion. This is particularly relevant now given the market consensus that rates will rise and wider macroeconomic uncertainty.</p>
Total Market Return (TMR)	<p>The primary changes in the approach at PR19 relate to inflation series and averaging, although the former has a greater impact on the estimate. Ofwat relied solely on the Bank of England Consumer Price Index (CPI) series to deflate historical returns, to derive a TMR in real CPI terms. Ofwat converted the TMR in real Consumer Price Index including owner occupiers' housing costs (CPIH) terms to Retail Price Index (RPI) terms, using an assumed 100 basis points wedge.</p> <p>At PR14, Ofwat chose a point estimate at the upper end of its range. This implicitly placed less weight on shorter-term and forward-looking data.</p>	<p>The PR19 estimate represented a reduction of 125 basis points from PR14, despite historical ex post returns being stable between PR14 and PR19 (arithmetic average). Of this change around 100 basis points relates to the way in which the change in inflation measure has been implemented.</p> <p>This approach does not reflect (1) the well-acknowledged stable nature of TMR over time and (2) the stability market data across the PR14 and PR19 price controls.</p> <p>As a result, this approach undermines regulatory stability and a focus on long term investment.</p>

## Impacts of regulatory approach

In case of mean reversion, if Ofwat maintains the spot approach that will result in customers bearing higher costs than they would have under a longer-term approach. At the same time, if Ofwat changes its approach based on how rates evolve, it will be clearly opportunistic and asymmetric. We also note the perverse incentives implied by a move towards current or spot market data in a long-term sector.

A clear example is Ofwat's proposed application of an 'outperformance wedge' to long term market benchmarks (the iBoxx 10Y+ A/BBB), where the observed wedge is primarily driven by the tenor of debt issued. This is incentivising us along with other companies to consider issuing debt at shorter tenors to avoid underfunding, but ultimately increases risks for both companies and customers.

It is concerning to us that, less than a year after the longest redetermination in a regulated sector, Ofwat has sought to revert from the CMA's decisions, introducing volatility and returning to a short-term focus. It is clear from the comparative assessment between Ofwat's risk and return consultation and the CMA appeal decisions – presented in the Water UK response to PR24 discussion paper on risk and return<sup>20</sup> – that Ofwat proposes to reject the CMA's approach at PR19 in favour of alternatives which are individually and collectively skewed to the downside.

Where a redetermination by the CMA has been sought, there is a broad obligation on the sector, including the regulator, to pay close attention to the decisions it takes and its rationale when considering the framework for future price controls.

Critically, the evolution of cost of equity as presented above does not capture any impacts from the application of Ofwat's selected cross-check evidence.

In general, we agree that it is appropriate to cross check the cost of equity given that there is a material degree of parameter uncertainty around the cost of equity estimate. This is because cost of equity is not directly measurable, and the parameters are subject to both theoretical debate and statistical uncertainty.

In this context, appropriately calibrated cross-checks can provide some comfort that the cost of equity is not materially understated. Although, since cross-checks themselves are subject to uncertainty (in terms of measurement and their ability to provide accurate signals regarding the required returns in the water sector), they can only provide partial mitigation against the risk of understatement and would need to be accompanied by a degree of aiming up to further mitigate the customer detriment from getting the cost of equity too low.

However, Ofwat's choice of cross checks is not appropriate for this purpose. Ofwat intends to use market-to-asset ratios (MAR) evidence to potentially re-open CAPM-based estimation despite its recognised limitations and flaws. A few examples include:

- MARs rely on an extensive set of assumptions about future performance drivers for a regulated utility, which are individually and together estimated/assumed with significant uncertainty.
- MAR are driven by company-specific factors and investor-specific assumptions; however, they are not guaranteed to materialise and do not represent the assumptions that investors in general may make about the sector as a whole.
- Transaction MAR do not represent pricing signals from a continuous, efficient, or liquid market.

<sup>20</sup>Economic Regulation Water-UK-Risk-and-Return-Response.pdf, Water UK, February 2022, (ofwat.gov.uk) p. 4.

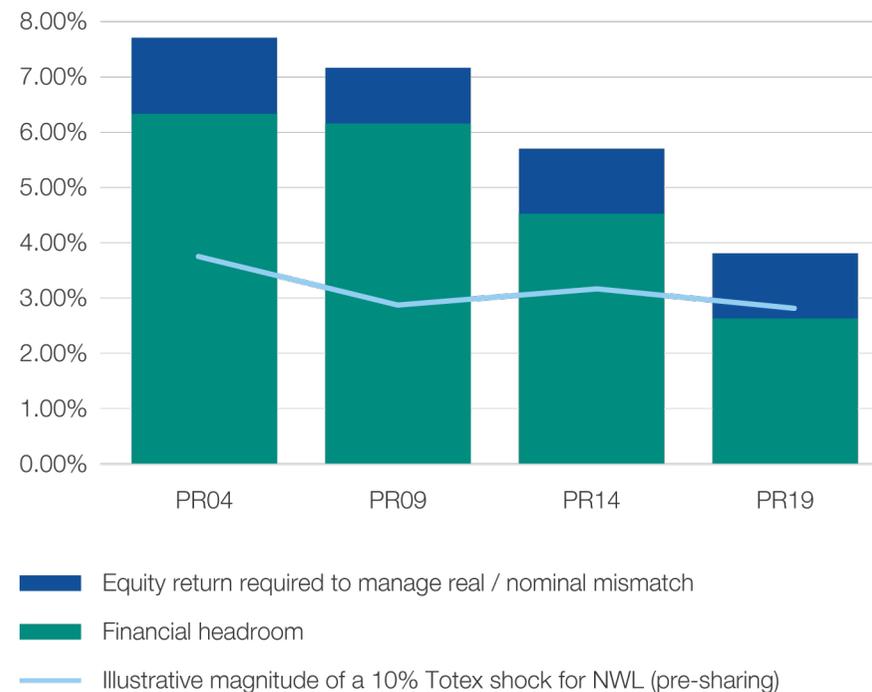
We agree with the CMA's conclusions at PR19 – which considered evidence of MARs across the last 20 years – that noted:

**“On balance, we remain cautious about using market prices to determine the point estimate for the cost of equity or overall cost of capital.**

**In the round, we do not consider any of the parties' MAR analysis to represent sufficient evidence to determine whether the CMA or Ofwat's cost of capital is more appropriate for the entire water sector... as a result, we have therefore not given the MAR analysis significant weight in coming to a final view on the point estimate<sup>21</sup>.”**

The primarily methodology-based fall in allowed returns has been accompanied by increasing risk exposure over time. This has significantly reduced water companies' financial buffer available to manage these risks, as illustrated in figure 5 to the right, which illustrates both the declining financial headroom for NWL and other water companies and the potential impact of a 10% totex shock overspend as an indicative plausible downside scenario.

**Figure 5: Illustrative evolution of financial buffer available for management of risk**



Source: NWL analysis of previous price determinations and market information

<sup>21</sup>Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations Final Report', CMA, March 2021., 9.1358

## How do we address these challenges?

For PR24 and the future what is needed is an approach that is both more stable and predictable and more focused on the long-term outcomes across both estimation of allowed returns and identification of the right risk allocation.

The recent water redeterminations from the CMA provide a sensible model and precedent for setting the allowed CoE and would facilitate a stable and predictable approach to risk and return. These redeterminations benefit from the longest and most rigorous review of the CoE parameters since privatisation and reflect the considered views of an independent panel of experts through an appeals mechanism that was established by Parliament to provide exactly this sort of arbitration and clarity. We set out the proposed methods for setting of the CoE parameters in the table on the following page.



**Table 2: Outline of CMA methodology for setting the Cost of Equity**

Parameter	CMA methodology (PR19)
RFR	The CMA relied on the evidence from ILGs and AAA rated corporate bonds to estimate RFR. It constructed a range for the RFR based on the yield on ILGs at the lower end and AAA rated corporate bonds at the upper end and selected the point estimate at the mid-point of this range. The CMA used an estimate of the long-term RPI-CPIH wedge to translate the RPI-linked Gilt yields into CPIH.
TMR	The CMA relied upon evidence from historical ex-post and the historical ex-ante approaches. The CMA concluded that limited weight should be placed on forward-looking evidence given reservations about the robustness of the forward-looking evidence and preference to maintain the assumption of a constant TMR over the long term.
Beta (excluding impact of de-levering/re-levering and treatment of covid data)	The CMA adopted an expansive approach estimating beta using a range of different time windows (2, 5, 10-year) and sampling frequencies (daily, weekly, monthly).
Treatment of Covid-19 data	The CMA set out to place equal weight on beta estimates from before and during the Covid-19 pandemic and applied an approach to testing outliers that further reduced the weight placed on Covid-19 affected data.
Beta-de-levering and re-levering	The CMA applied the Harris-Pringle approach to derive the beta estimates for the notional company, de-levering raw betas from listed comparators using enterprise value gearing and re-levering to the notional gearing.
Aiming-up	When setting the point estimate for the cost of equity, the CMA aimed up from the from the mid-point of the range by 25 basis points and emphasised the concept of aiming-up on the basis of the need to promote and retain investment, parameter uncertainty in the cost of equity; and ensuring financeability.

Using these methods would have advantages beyond providing stability and consistency for investors including that:

- They are clearly more demonstrably in the long-term interest than Ofwat's proposed approaches for PR24 which move us back towards spot rates;
- Long-term approaches – if applied consistently – can support a more stable bill profile in line with customer preferences; and
- If the CMA's findings are not given due consideration, this creates the real risk that the same issues are returned to the CMA on multiple occasions, damaging confidence in the regulatory model<sup>22</sup>.

We are aware that the UK Regulators Network is currently undertaking work that is seeking to drive greater consistency in the assessment of returns across different sectors. This can also be an important vehicle for driving long-term consistency over time and appropriate long-term focus.

In addition to the above, we expand on cross-checks as, when appropriately selected and calibrated, they can provide additional evidence that allowed returns are sufficient to enable required investment.

<sup>22</sup>A good example of this is Ofwat's approach to the small company premium (including the 'customer benefits test', which Bristol Water brought to the CMA and its predecessor body three times (PR09, PR14 and PR19) with the CMA rejecting Ofwat's approach on each occasion. Despite each rejection, Ofwat chose not to reflect the CMA or its predecessor's views in its subsequent price control methodology and is only now accepting it.

## Multi factor models

We consider that a logical methodology for cross checking the allowed returns implied by the CAPM (a single factor model) may be to consider returns implied by multi factor models (MFM). These models represent an extension of the CAPM model which explains excess returns based on a single risk factor, beta i.e., systematic risk, and are recognised to have greater explanatory power for observed returns.

The rationale for cross checking allowed returns based on MFM evidence is as follows:

- Whilst the primary methodology adopted in utility regulation has typically been CAPM – given the simplicity of the model and the ease of calculation – academic research has revealed limitations in its explanatory power of observed returns and has found MFMs to be superior.

- The CMA has acknowledged that MFMs have superior explanatory power, noting that they have not been adopted by regulators due to challenges associated with populating them. We recognise that implementing this approach in practice is challenging, but we consider the collation of the required data is practicable given the time available at this early stage of the PR24 process and could be explored further.
- MFMs were also considered by Wright et al in their 2018 paper for UKRN where the authors noted that MFMs can provide a helpful cross-check on standard techniques for estimating CAPM betas.

## Financeability assessment

The financeability assessment, which is explicitly linked to Ofwat's financeability duty, should be viewed as the primary cross check to the allowed CoE (as well as the overall price control package) consistent with the CMA's approach at PR19.

A financeability assessment which reflects market-based methodologies is essential to ensure that the regulated company has continuous access to finance – required for investments into customer service, asset health / resilience and to achieve stretching environmental targets – at reasonable rates.

This is because the financeability test draws a direct link between allowed returns and projected cashflows, credit ratios and the equity buffer available for risk management. The CMA noted that the WACC was the primary factor in ensuring that an efficient firm can finance its functions and that the right WACC would ensure both debt and equity financeability.

By contrast Ofwat's proposed changes to the notional capital structure – against CMA outcomes – risks undermining the financeability test as a meaningful and binding cross check on allowed returns and price control calibration which investors can rely on as a stable and predictable cornerstone of the regulatory framework.

## Consistency of equity returns and financial risk exposure

Risk analysis as a cross check to allowed returns promotes consistency between the calibration of allowed returns and supporting company financial resilience. Similar to the financeability assessment, using risk analysis as a cross check on returns is consistent with the notion that there is an intrinsic link between the allocation of risk between companies and customers, the returns allowed by Ofwat, and the financial resilience of companies.

As recognised by Ofwat<sup>21</sup> uncertainty and risks are increasing, and a broad range of scenarios may manifest themselves due to factors outside companies' control such as climate change policies. This reinforces the relevance and importance of risk analysis as a cross check.

Given the long-term investment horizon for the sector as well as the transition to longer-term planning as outlined in Ofwat's Long-term Delivery Strategies and Common Reference Scenarios paper, risk analysis for the sector should follow a holistic approach which considers, among other things:

- Evolution of risk drivers and impacts over a long-term horizon, e.g. several AMPs, under different possible states of the world. Ofwat has signalled that 'decisions relating to adaptation should take account of the magnitude of risk, but also the urgency of the risks'<sup>23</sup>;
- Inter-connectivity between risks in the system and how they trigger and amplify one another, resulting in catastrophic service risk events;
- When the risks might crystallise (the velocity of risk);
- The impacts of different investment choices on risk exposure; and
- Analysis of consistency between financial risk exposure and equity returns.

In this context, it is important to recognise the importance of catastrophic service risk, which can be defined as a very infrequent but a very high impact event, potentially something that the company might not be able to deal with itself. This is important because a normal company can cease production of a certain product or halt production all together for some time; a water company cannot.

Ofwat on the one hand is very concerned about financial distress and associated costs but has not recognised non-systematic risks which include catastrophic service risks. If there is a high cost of failure then CAPM will not capture or price that correctly – hence the importance of using risk analysis to cross check returns.



<sup>23</sup>PR24 and beyond: Long-term delivery strategies and common reference scenarios', Ofwat, November 2021.

Critically the risk analysis required to support long term financial resilience is company specific and based on business and operational data. Using forward looking risk analysis can help to address the issues in using historical data, which can be liable to underestimate risk exposure where risks and uncertainty are increasing. We set out two key approaches required to enhance risk analysis at PR24 and support long term financeability, resilience and risk management.

**Figure 6: Approaches to risk analysis**

**Top-down risk analysis:**

This approach systematically defines and maps the company's understanding of risk to assess potential risks on a forward looking, network basis. Using forward looking approaches in addition to backward looking approaches can be important as the past is not always a good guide to the future. (Changes in the regulatory regime can for example introduce structural breaks in risk exposure.)

Top-down risk analysis identifies and defines the key drivers of operational risk to estimate financial exposure.

A top-down approach estimates the scale, likelihood and velocity of individual risks taking into account their inter-connectivity based on network theory.

**Bottom-up stochastic risk modelling:**

This approach requires stochastic risk analysis which relies on historical data based on the underlying operational and business drivers.

The model estimates the impact of risks and develops scenarios using statistical techniques (such as Monte Carlo simulation) that are supported by analysis of probability and correlation. The model considers a range of potential outcomes for individual risks and/or combinations of risks.

The risk modelling is intrinsically linked to business data and underpins a robust analysis of risk based on corporate finance principles and best practice from other sectors.

## Cross checks to support consistency across sectors and over time

To support consistency of allowed returns with wider infrastructure and utilities benchmarks, the allowed CoE could be cross checked against infrastructure fund discount rates and target returns. The increasing need for strategic investments driven by requirements to deliver greater resilience, Net Zero, environmental protection, and other reasons may mean greater scarcity of capital in future compared to previous regulatory periods. Reviewing broader infrastructure and utility benchmarks may continue to provide a useful reference point. These benchmarks may evolve gradually but could reveal emerging trends. There are a range of these benchmarks that can be gathered and then analysed to ensure debt and equity investments are appropriately distinguished and that outliers are removed.

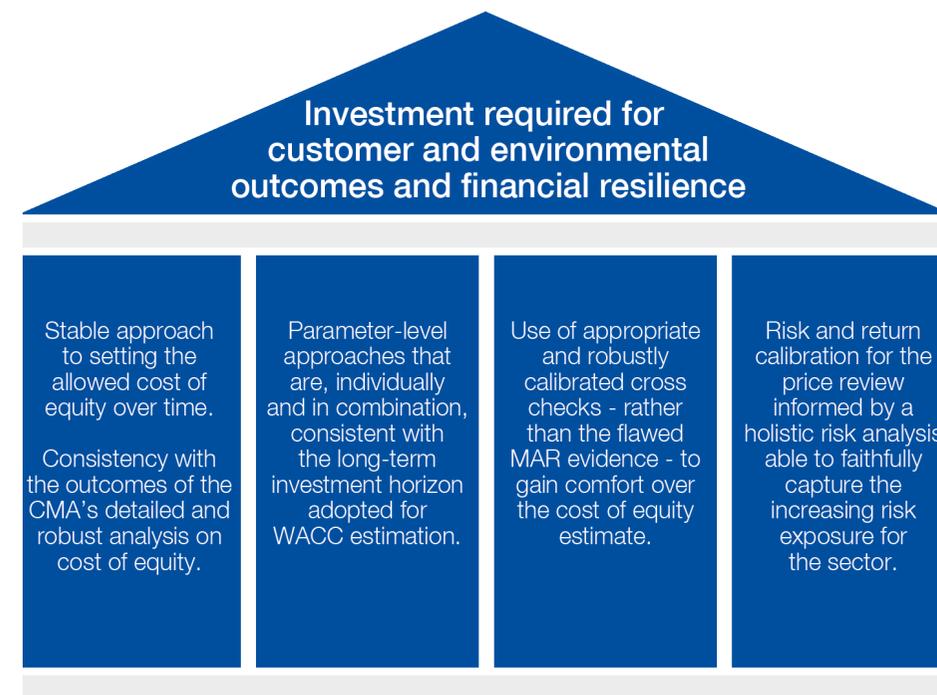
To support consistency of allowed returns over time, the allowed returns could be cross checked against changes in long-term company profitability. This data can be reviewed across the long-term and compared to changes in the risk-free rate to assess whether there is a relationship between the two.

This source of evidence can provide a useful alternative perspective that is based on business fundamentals and the realities of earnings in the economy. It provides a different perspective to equity valuation data from financial markets.

### Key pillars of the regulatory framework

We have summarised the key pillars of a regulatory framework which is best placed to facilitate long term investment required and to mitigate the risks of customer detriment relating, among other things, to service levels (including resource availability), environmental outcomes, financial resilience, increased costs of deferred investment and associated intergenerational inequity.

Figure 7: Key pillars of our regulatory framework



Source: NWL analysis of previous price determinations and market information

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