



# **UKRN Cost of capital – review of guidance on methodology for setting cost of capital**

## **CONSULTATION**

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## UKRN Cost of capital: Review of guidance - consultation

### Executive Summary

The allowed return on capital is an important feature of most economically regulated sectors. It supports the mechanism whereby customers in these sectors can pay for capital infrastructure assets over their economic life, rather than paying entire costs upfront - with the markedly higher bills this would imply in the short term. Regulators have an important task in setting the allowed return at the appropriate level. Adequate financing may be at risk if investors are not adequately compensated for the risks they bear, while regulatory legitimacy is threatened by excessively high allowed returns that result customers paying more than they need to.

The original 2023 version of this guidance<sup>1</sup> was developed in response to the UK Government's 2022 Economic Regulation Policy Paper<sup>2</sup>. This paper identified as an issue that differences between sectors in allowed return estimation were not always clear to stakeholders. It proposed that there was a strong case for regulators to align in approaches used, especially for allowed return inputs with less sector-specific characteristics. A taskforce of Ofwat, Ofgem, Ofcom, ORR, CAA and the Utility Regulator for Northern Ireland (UR) worked together to develop common principles for allowed return estimation, consulted on these principles and subjected them to a peer review by expert practitioners in the field.<sup>3</sup> All participating regulators from the taskforce have now committed to have due regard to the finalised guidance in their future price controls.<sup>4</sup>

This guidance has helped promote consistency in regulatory decision-making. Recent regulatory decisions and methodologies have referenced the guidance extensively and, particularly around the range of Total Market Return in recent decisions and proxies used to derive risk-free rate, there is closer alignment than prior to the introduction of the guidance. The guidance has also featured in the CMA's recent PR24 redeterminations<sup>5</sup>, where it was referenced in several places and supplied the framework for choosing a point estimate for the allowed return on equity. However, it was always intended that the guidance should be updated to reflect new developments, and in the current guidance document these regulators have once more pooled their thinking to consider potential changes and identify areas where further alignment can usefully be achieved.

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<sup>1</sup> [https://ukrn.org.uk/app/uploads/2023/03/CoC-guidance\\_22.03.23.pdf](https://ukrn.org.uk/app/uploads/2023/03/CoC-guidance_22.03.23.pdf)

<sup>2</sup> <https://assets.publishing.service.gov.uk/media/61f7b7d78fa8f5388825116d/economic-regulation-policy-paper.pdf>

<sup>3</sup> John Earwaker and Craig Lonie

<sup>4</sup> This builds on the 2023 guidance which CAA did not immediately sign up to because of sensitivities around ongoing price controls at the time of publication.

<sup>5</sup> <https://www.gov.uk/cma-cases/water-pr24-price-redeterminations>



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The changed macroeconomic environment has brought new challenges. For instance, while the 2023 guidance was drafted following a lengthy period of low interest rates, UK interest rates have now returned to levels observed in the early 2000s. This has led to renewed debate around the appropriate regulatory response, particularly given that the PR24 CMA panel's March 2026 final determination did not align with Recommendation 4 of the 2023 guidance.<sup>6</sup> The CMA panel's final report suggested that a targeted review of the approach to estimating TMR might be beneficial to customers, given the backdrop of plans to attract significant infrastructure investment to the UK.<sup>7</sup>

Further developments since the last guidance was published include a material increase in the number of market cross-checks proposed by companies, and statements from some stakeholders that may indicate further scope for alignment in the way regulators set allowed returns.<sup>8</sup> This guidance document contains the joint view of regulators on how best to deal with these developments. Following the approach taken for the 2023 guidance, this draft guidance invites consultation over an 8-week period and has been independently peer reviewed.<sup>9</sup> Stakeholders will also have an opportunity to discuss the contents of this document further at stakeholder workshops held within the consultation period.

The primary focus of this guidance remains on the approach to setting the allowed return on equity, including its components and the framework for choosing a point estimate. Sector-specific considerations are less important for this element of the allowed return, and so it represents a more logical area in which to increase consistency. Based on recent developments in regulatory practice and theory, regulators have freshly considered and endorsed the methodologies that are implementable and defensible, while having regard to the merits of transparency and consistency between sectors and over time. It is however important to note different circumstances in regulated sectors (especially around equity beta and cost of debt) which make complete alignment of approach undesirable.

This guidance is not intended to replace regulators' discretion with a mechanistic application of rules. While consistency is important, it is desirable that regulators should have the flexibility to respond to scenarios where significant changes (e.g. large shifts in financial market dynamics) challenge established thinking. Moreover, nothing in this guidance overrides relevant legislation or the principle of regulatory independence – regulators must continue to make decisions in accordance with their

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<sup>6</sup> Recommendation 4 states: "Regulators should estimate the equity risk premium (ERP) within the CAPM as the difference between total market return (TMR) and the risk-free rate (RFR). We recommend that the TMR should be primarily based on historical ex post and historical ex ante evidence."

<sup>7</sup> CMA, 'Final Determinations Volume 4: Allowed Return', para 7.427

<sup>8</sup> Independent Water Commission, '[IWC Final Report](#)', paras 405-406, 21 July 2025

<sup>9</sup> By John Earwaker of First Economics, who provided peer review of the 2023 guidance.



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respective statutory duties. This notwithstanding, regulators expect departures from the guidance to be by exception, based on strong evidence, and explained transparently.

Following deliberation on the 2023 guidance and new developments, the provisional view of regulators is that most recommendations of the original draft guidance remain appropriate, but there is scope to align further on the detail behind these recommendations to increase consistency and transparency. These recommendations are set out below, and the regulators named in this document commit to having due regard to them in future price control decisions on allowed return setting.<sup>10</sup> One exception is Recommendation 5 – Equity Risk Premium, where participating regulators are seeking further input as part of this consultation before alighting on a settled position.

**Recommendation 1 – Notional company:** *Regulators should continue to estimate the allowed rate of return in price controls based on the weighted average cost of capital for a notionally-financed firm within their sector.*

**Recommendation 2 – CAPM:** *Since the cost of equity is not directly observable, it must be estimated using a widely accepted method. Regulators should continue to use the capital asset pricing model (CAPM) as their primary approach for estimating the cost of equity.*

**Recommendation 3 - Gearing:** *The notional gearing assumption should reflect the regulator’s assessment of the balance of risks facing the regulated company, a wide range of benchmarks on gearing levels and overall regulatory policy objectives, not just that of the actual company (or companies) in question.*

**Recommendation 4 – Risk-free rate:** *To estimate the real risk-free rate (RFR) within the CAPM, regulators should use recent yields on the index-linked gilts, with a maturity which matches the assumed investment horizon for their sector.*

**Recommendation 5 – Equity risk premium:** *[This recommendation is under review pending the outcome of this consultation – see [Chapter 4](#)]*

**Recommendation 6 – Equity beta:** *Regulators should estimate equity beta for the notional company using comparable listed companies and standard regression techniques (i.e. ordinary least squares (OLS)). Where the listed comparator has different gearing to the notional company, regulators should continue to de-lever and re-lever the raw equity beta.*

**Recommendation 7 – CAPM point estimate:** *The RFR, TMR and (re-levered) equity beta assumptions should be combined using the CAPM to produce a cost of equity*

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<sup>10</sup> The 2026 Water White Paper signals Government's intent to replace Ofwat with a new regulator over coming years. Ofwat cannot commit its successor organisation to any course of action, however UKRN expects to provide an update on the status of the guidance to the new regulator in future publications.



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range. The mid-point of the range should be used as the central estimate for the CAPM cost of equity.

**Recommendation 8 – Cross-checks:** *Cross checks may be used to sense check the CAPM derived point estimate. However, regulators should only deviate from the mid-point of the CAPM cost of equity range if there are strong reasons to do so.*

**Recommendation 9 – Cost of debt:** *Regulators should estimate an allowance for an efficient company under the notional financial structure, with actual debt costs suitably benchmarked against other market evidence.*

### Areas of increased alignment compared to the 2023 guidance

Regulators agree that the following more detailed guidance should form the basis for further alignment, building on the 2023 document:

- Choosing a data cut-off no further back than 6 months from the publication of final determinations to derive estimates for the risk-free rate and equity beta. (See [Chapter 3](#) and [Chapter 5](#))
- Using index-linked gilts as the sole proxy for the risk-free rate assumption. (See [Chapter 3](#))
- Using a 1-month averaging period for the risk-free rate assumption (except where there is clear evidence of atypical market volatility in this period). (See [Chapter 3](#))
- Basing 'ex-post' TMR estimates on a 1-year holding period arithmetic average of real equity returns, rather than more complex approaches. (See [Chapter 4](#))
- To use 2-, 5- and 10-year windows and daily data as a starting point for estimating equity beta (where practicable, and no thin trading issues). (See [Chapter 5](#))
- Considering novel market cross-checks against a new framework focusing on the dual themes of defensibility and implementability, featured in the 2018 academic review. (See [Chapter 6](#))
- Reflecting recent evidence on inflation dynamics in the setting of real-terms allowances, to limit the role of forecast risk in driving inflationary gains and losses. (See [Chapter 7](#))



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### Responding to this consultation and next steps

We welcome views on the questions and issues raised in this consultation by **19 August 2026** via email to [consultation.ukrn@caa.co.uk](mailto:consultation.ukrn@caa.co.uk). The UKRN intends to publish the final version of the guidance later in 2026.

Specifically, we are seeking views on the following questions:

**Question 1:** *Do you agree with the proposed recommendations in this document?*

**Question 2:** *When determining the range for TMR, to what extent should UKRN members place weight on estimates of TMR derived additively from estimates of the ERP combined with the RFR?*

**Question 3:** *If supportive of placing weight on TMR estimates relying on ERP, which approaches to estimating ERP should UKRN members consider adopting?*

**Question 4:** *Do you have views on potential issues that UKRN members may want to consider for further investigation?*

We are minded to publish all responses on the UKRN website and, subject to the following, by providing a response you are deemed to consent to its publication.

Information provided in response to this document, including personal information, may be published or disclosed in accordance with access to information legislation – primarily the Freedom of Information Act 2000 (FoIA), the General Data Protection Regulation 2016, the Data Protection Act 2018, and the Environmental Information Regulations 2004. For further information on how UKRN process personal data, please see the [CAA's Privacy Policy](#).

If you would like the information that you provide to be treated as confidential, please be aware that under the FoIA there is a statutory [code of practice](#) which deals, among other things, with obligations of confidence.

If you think that any of the information in your response should not be disclosed (for example, because you consider it to be commercially sensitive), an automatic or generalised confidentiality disclaimer will not, of itself, be regarded as sufficient. You should identify specific information and explain in each case why it should not be disclosed and provide a redacted version of your response, which we will consider when deciding what information to publish. At a minimum, we would expect to publish the name of all organisations that provide a written response, even where there are legitimate reasons why the contents of those written responses remain confidential.



## UKRN Cost of capital: Review of guidance - consultation

# Introduction

## Background

1. In most sectors subject to economic regulation, regulators rely on price controls as a tool to protect the interests of consumers. Where regulators set price controls with reference to expected efficient costs of delivering the service, it is usual to consider financing costs as one component, and to express this as a percentage rate of return multiplied by the value of the asset base for the regulated sector in question. Growth in these asset bases over the past few decades has meant the allowed return has become an increasingly important component of the price for that service. This means companies, investors and consumer bodies will continue take a strong interest in how the allowed return is derived.
2. In March 2023, UKRN published the original guidance for regulators on the methodology for setting the cost of capital,<sup>11</sup> in response to a request from government to look for ways to improve consistency across regulators involved in setting an allowed return on capital for their sectors.<sup>12</sup>
3. In the three years since that guidance was published, a number of regulatory price review processes have been completed, which has given UKRN members the opportunity to implement the guidance and reflect on additions, amendments and potential improvements.
4. There has also been renewed interest from government in cost of capital as a driver of investment, to help deliver on the government's ambition to attract over £700bn of investment in UK infrastructure by 2035.<sup>13</sup> The recent Defra White Paper references work underway across a number of government departments and agencies on cost of capital to "*consider wider alignment of methodologies and processes across economic regulators*".<sup>14</sup>
5. In that context, UKRN members have undertaken a review of the cost of capital guidance, and this document sets out:

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<sup>11</sup> UKRN guidance for regulators on the methodology for setting the cost of capital, UKRN (2023): [https://ukrn.org.uk/app/uploads/2023/03/CoC-guidance\\_22.03.23.pdf](https://ukrn.org.uk/app/uploads/2023/03/CoC-guidance_22.03.23.pdf)

<sup>12</sup> Economic Regulation Policy Paper, Department for Business, Energy & Industrial Strategy (2022): [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1051261/economic-regulation-policy-paper.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1051261/economic-regulation-policy-paper.pdf)

<sup>13</sup> UK Infrastructure: A 10 Year Strategy, HM Treasury & NISTA (2025): [https://assets.publishing.service.gov.uk/media/6853c5db99b009dcdcb73649/UK\\_Infrastructure\\_A\\_10\\_Year\\_Strategy\\_Web\\_Accessible.pdf](https://assets.publishing.service.gov.uk/media/6853c5db99b009dcdcb73649/UK_Infrastructure_A_10_Year_Strategy_Web_Accessible.pdf)

<sup>14</sup> A New Vision for Water, Department for Environment, Farming & Rural Affairs (2026): [https://assets.publishing.service.gov.uk/media/696f52c9011505255b2d41f1/Defra\\_Water\\_White\\_Paper\\_2026.pdf](https://assets.publishing.service.gov.uk/media/696f52c9011505255b2d41f1/Defra_Water_White_Paper_2026.pdf)



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- how UKRN members have followed the guidance since it was published;
- updated discussion on how best to apply the guidance, as agreed by UKRN members;
- exploration of relevant considerations around applying ERP evidence to inform the TMR range, following the PR24 CMA panel adopting such an approach, and suggesting that a review of the established TMR methodology might be beneficial to customers.<sup>15</sup>

### Role of UKRN guidance

6. Across both the guidance and our cost of capital Annual Reports<sup>16</sup>, the intention behind UKRN's work is twofold:
  - To **increase the consistency** in how regulators approach calculating the cost of capital, and
  - To **increase the transparency** of the underlying assumptions and processes for setting cost of capital.
7. Greater transparency and consistency should reduce the uncertainty in outcomes of regulatory decision-making processes and facilitate cross-sector comparisons of the cost of capital. In addition, greater alignment should improve the predictability of regulatory decisions and may reduce the perceived risk of investing in UK infrastructure. This should in turn benefit consumers by increasing the attractiveness of investing in UK regulated sectors and lowering these sectors' financing costs.
8. While recognising the positive effects of cross-sectoral consistency in estimation approaches between regulators, there is also value in individual regulators continuing to demonstrate consistency in their approach to a given sector over time. This can be particularly important given the emphasis of credit rating agencies on the stability and predictability of the regulatory regime, when determining ratings for regulated companies. This implies that cross-sectoral alignment involving change within a particular sector should not be rushed, and involve early signalling and proper consultation with the stakeholders of that sector.
9. We intend that this guidance would be applicable where regulators explicitly set cost-based price controls using the 'building blocks' approach (see Annex). In some sectors, particularly telecoms, regulators also use other approaches to cap prices,

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<sup>15</sup> CMA, 'Final Determinations Volume 4: Allowed Return', para 7.427

<sup>16</sup> <https://ukrn.org.uk/publications/?theme=cost-of-capital>

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such as anchor pricing<sup>17</sup> or safeguard caps, where the prices do not necessarily follow the projected path of efficient costs (including capital costs) and therefore this guidance would not directly influence prices. There will also be other instances where regulators require an estimate of a cost of capital or a discount rate (e.g. to appraise investments or to settle disputes) or are seeking to secure financing for novel or bespoke investment projects, and these cases are also not covered by this guidance.

10. Consistent with the 2023 guidance, several areas remain out of scope of the guidance:

- **Tax:** While most regulators set a 'Vanilla' WACC,<sup>18</sup> decisions over how to remunerate tax charges are outside the remit of a document dealing with allowed returns.
- **Real or nominal allowed return:** While regulators setting a real WACC have increasingly gravitated to CPIH as the relevant inflation index, it is equally valid and commonplace to set a nominal WACC (e.g. Ofcom's Telecoms Access Review). While the decision to set a nominal or real WACC will affect the profile of cashflows, the choice between these options should be neutral in present value terms, and so this guidance does not seek to establish consensus around a preferred approach. (Ofgem's semi-nominal approach to setting the allowed return on debt allowance is discussed in [Chapter 7](#))

### Impact of UKRN guidance

11. When the guidance was published in March 2023, the 'Named Regulators' (i.e. Ofwat, Ofgem and Ofcom), ORR and the Utility Regulator committed to having regard to the guidance in their future price control decisions, where this is permitted by their statutory duties, and to deviate only where they considered there were good reasons to depart from the recommendations.

12. However, this timing meant that the guidance was published whilst some regulators were in the process of making draft or final price control decisions, which were subject to appropriate consultation and careful consideration. It was therefore not expected that the guidance recommendations should be adopted for those decisions. For example, the CAA agreed to review its approach to the cost of capital and how to best have regard to the positions set out in the guidance after the end of

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<sup>17</sup> Anchor pricing refers to setting a regulated price cap on a basic "anchor" product (e.g. wholesale access to a basic broadband connection) with pricing flexibility on other products (e.g. wholesale access to higher speed broadband connections).

<sup>18</sup> i.e. with a post-tax cost of equity and a pre-tax cost of debt



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the H7 and NR23 reviews, completed in March and November 2023 respectively, and has now proposed to align its approach with the UKRN guidance.<sup>19</sup>

13. The recommendations of the 2023 UKRN guidance document are not binding. Nonetheless, UKRN member regulators have closely followed this guidance since its publication,<sup>20</sup> leading to closer alignment of both methodologies and outcomes, as set out in more detail below and throughout the chapters of this document. As required by the guidance, where regulators have taken a different approach, they have clearly set out the reasons and evidence for this. We also note that the PR24 CMA panel's March 2026 Final Determination made extensive reference to the guidance, including adopting its framework for selecting a point estimate within the CAPM range.
14. We are thinking about ways of improving the clarity and transparency around this alignment in approach and potential deviation (where it occurs) through our regular annual reports and would welcome views and ideas from respondents on how best to achieve this.

### Scope of review

15. This consultation largely follows the structure of the original guidance, with a focus on the common parameters for estimating the cost of equity and the overall framework for choosing a point estimate for the allowed return on equity, due to these areas having the greatest commonality across regulators.
16. In some areas, we have re-ordered the recommendations of the 2023 guidance to be a better fit with the host chapters. For example, Recommendation 9 (Gearing) from the old guidance is now featured alongside Recommendation 1 (notional company), recognising that both concern structural assumptions about the notional company.
17. We have limited ourselves to a view on technical matters related to the guidance and have not therefore considered interactions with proposed changes to the structure of the regulatory system, or changes to the status of UKRN as a voluntary membership organisation.

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<sup>19</sup> CAA, '[H8 Initial Proposals Section 3: financial issues and calculating the price cap](#)', March 2026, para 9.25, p14

<sup>20</sup> This is true for Ofwat's PR24 Final Determination (Dec '24), and Ofgem's RIIO-3 Final determination (Dec '25).

## 1. Overall framework for estimating allowed returns

**Recommendation 1:** *Regulators should continue to estimate the allowed rate of return in price controls based on the weighted average cost of capital for a notionally-financed firm within their sector.*

**Recommendation 2:** *Since the cost of equity is not directly observable, it must be estimated using a widely accepted method. Regulators should continue to use the capital asset pricing model (CAPM) as their primary approach for estimating the cost of equity.*

18. In UK economic regulation, the allowed rate of return is typically estimated by reference to the weighted average cost of capital (WACC) for the relevant regulated activity. The respective weights for the cost of debt and equity are provided by the notional gearing assumption, as expressed in the following equation:

$$WACC = (gearing) \times K_d + (1 - gearing) \times K_e$$

Where:

- $K_d$  is the cost of debt
- $K_e$  is the cost of equity, and
- gearing is the share of debt as a percentage of the combined debt and equity value of the firm.

### Current approach

19. The cost of debt in the WACC is measured in pre-tax terms (since interest payments are deductible from profits when calculating liability for corporate taxation), whereas equity returns are measured in post-tax terms (since equity investors receive any profits net of the payment of corporation tax). The WACC in the formula above is therefore a vanilla WACC – in that the cost of equity is not uplifted for the corporate tax wedge between debt and equity (i.e. by  $\frac{1}{(1-t)}$ , where  $t$  is the corporate tax rate).

20. The cost of debt ( $K_d$ ) is typically estimated with reference to observed market yields on corporate bonds, either issued directly by the regulated entities or by entities with similar credit risk. Most regulated sectors make an allowance for historically-incurred debt costs, as well as costs of new debt expected to be issued during the control period. In sectors with several regulated companies, it is commonplace for regulators to set a single allowance, either benchmarked to an average of

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companies' actual debt costs or to a general bond index (e.g. the iBoxx £ A/BBB 10+ non-financials index).

21. All UK regulators use the Sharpe-Lintner Capital Asset Pricing Model (CAPM) as their primary approach to estimating the cost of equity for the notional company.

$$K_e = R_f + (R_m - R_f) \times \beta_e$$

Where:

$R_f$  is the risk-free rate (RFR)

$R_m$  is the Total Market Return (TMR)

$(R_m - R_f)$  is the Equity Risk Premium (ERP)

$\beta_e$  is the equity beta.

22. Under the CAPM the cost of equity ( $K_e$ ) is a function of the risk-free rate ( $R_f$ ), the expected return on the equity market above the risk-free rate, i.e. the equity risk premium (ERP), and the systematic risk of the relevant activity, i.e. equity beta ( $\beta_e$ ).
23. The CAPM is widely used in the private sector as well as in economic regulation and its use continues to be supported by leading corporate finance textbooks.<sup>21,22</sup> For instance Graham (2022)<sup>23</sup> identifies that in a survey of US Chief Financial Officers (CFOs), the majority continue to use the CAPM to estimate the cost of equity. Although alternatives (e.g. multi-factor models) exist, these are not as prevalent and exist in different variants – there is little consensus on which of these is best suited for use in forecasting the cost of equity.

### Overall framework: Guidance

24. In the view of UKRN members, the key benefits of the CAPM remains its use by financial practitioners, familiarity to investors, limited number of public and easily-obtained inputs (numbering just three) and its transparency, relative to other potential methodologies. These factors support the retention of the CAPM as the primary approach for cost of equity estimation.

<sup>21</sup> Berk, J. and P. DeMarzo (2020) *Corporate Finance* (5th Global Edition). Essex, UK.

<sup>22</sup> Brealey, Richard A., Stewart C. Myers, Franklin Allen, and Pitabas Mohanty (2020). *Principles of corporate finance*, 13/e. McGraw-Hill Education.

<sup>23</sup> Graham, J. R. (2022). "Presidential address: Corporate finance and reality." *The Journal of Finance*, 77(4), 1975-2049.

## 2. Gearing

**Recommendation 3:** *The notional gearing assumption should reflect the regulator's assessment of the balance of risks facing the regulated company, a wide range of benchmarks on gearing levels and overall regulatory policy objectives, not just that of the actual company (or companies) in question.*

25. Gearing is an important assumption within the CAPM framework; it determines the weight of the allowed return on debt and equity in the WACC, and also plays a direct role in calculating equity beta through the re-levering of betas (see [Chapter 5](#)).

### Current approach

26. All regulators assume a stylised ('notional') financing structure for their sector. This means that the gearing assumed for the notional company whose allowed return is being estimated can be based on a range of evidence – it does not have to faithfully resemble actually-observed financing structures of regulated firms. While companies are usually free to deviate from the notional gearing, they do so at their own risk, because the allowed return and tests to establish financeability (where applicable),<sup>24</sup> tend to assume the notional gearing assumption rather than actual gearing.

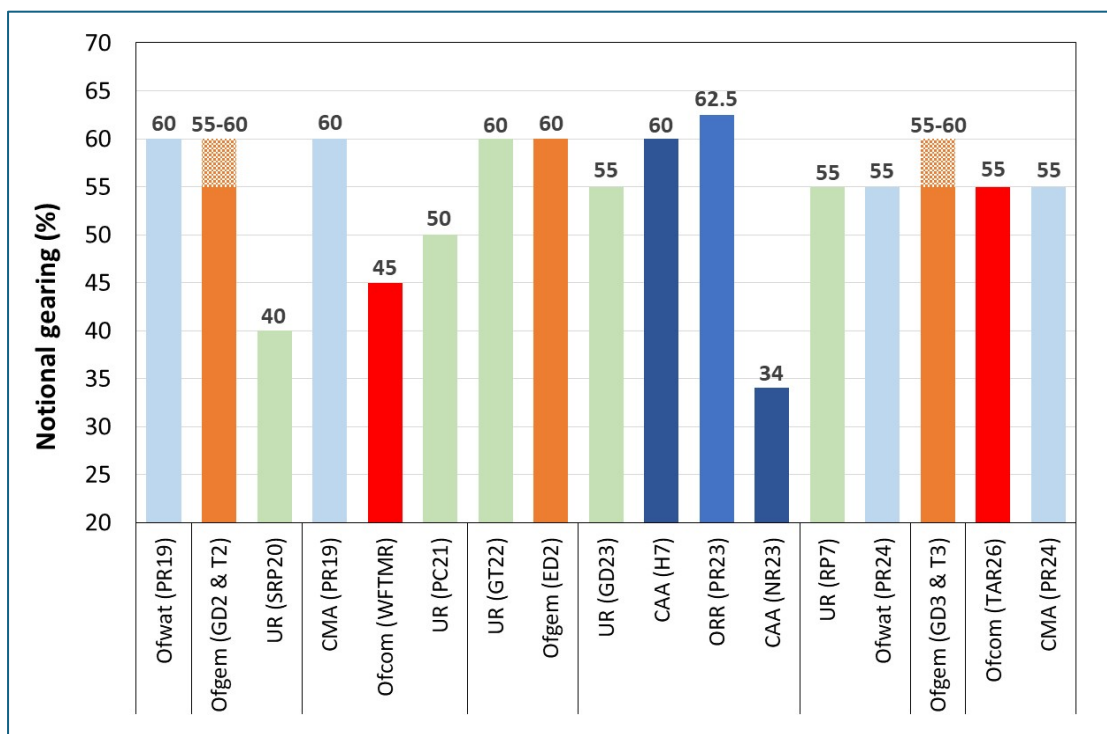
27. Regulators have opted for a relatively wide range of notional gearing assumptions in recent price control determinations (see Figure 1 below). In part, these cross-sector differences can be especially pronounced where there are few suppliers or even only a single operator (e.g. aviation, rail, Northern Ireland utility markets).

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<sup>24</sup> Financeability tests aim to establish whether the notional company can demonstrate financial ratios consistent with the target credit rating. Not all regulators employ financeability tests.

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Figure 1: Notional gearing from recent price control decisions



Source: UKRN Cost of Capital Annual Reports

28. Notional gearing may change over time. For instance, between PR19 and PR24 Ofwat chose to reduce its notional gearing assumption from 60% to 55%. This decision was based on multiple factors, including gearing benchmarks, incentive strength faced by investors, and the increased investment needs of PR24. It assessed that such a change in gearing was achievable for the notionally-gearred company without external equity injections, due to the impact of high forecast inflation.<sup>25</sup>

### Gearing: guidance

29. Regulators should continue to use a notional gearing assumption to determine the weights of the WACC allowance, rather than actual gearing levels. This approach protects customers from bearing the costs of companies' financing structure decisions.

30. The notional gearing assumption should be based on the level of gearing which is appropriate for a representative, efficiently-run company, given the characteristics of the price control. A range of evidence is likely to be relevant, including:

- notional company risk profile:** Whether the level of gearing provides the notional company with a sufficiently large equity buffer to absorb shocks, given its risk exposure in the market it operates in – including the extent of protection

<sup>25</sup> Ofwat, '[PR24 Final methodology Appendix 10: Aligning risk and return](#)', p25, December 2022



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(or exposure) under the regulatory framework. Higher risk is associated with lower gearing levels.

- **financial resilience:** The notional gearing assumption determines the basis on which allowed returns are set and underpins the financeability assessment (where this is relevant). As such, notional gearing has an important signalling and incentive function and should be set in a way which is consistent with the regulator's aims for sector-wide financial resilience.
- **trends in comparators' actual gearing:** While the intention is to set a notional level of gearing (and thus avoid being solely reliant on the actual choices of the regulated company), the current and previous financing choices of the companies in the sector may give an indication of what the companies themselves judge to be an efficient capital structure, particularly where companies maintain a strong investment grade credit rating.
- **external benchmarks:** A range of benchmarks could be considered, not just the gearing of the regulated company in question. For example, the gearing of other firms in the sector (domestically or overseas) and/or that of firms undertaking similar activities can all provide useful benchmarks.
- **relationship with the allowed return:** It may be important to sense check the combination of the notional gearing, asset beta and debt assumptions, and the relative impact of gearing on the WACC.

31. These considerations are likely to vary across controls, therefore it is unlikely that one notional gearing assumption for a given sector will be universally appropriate.

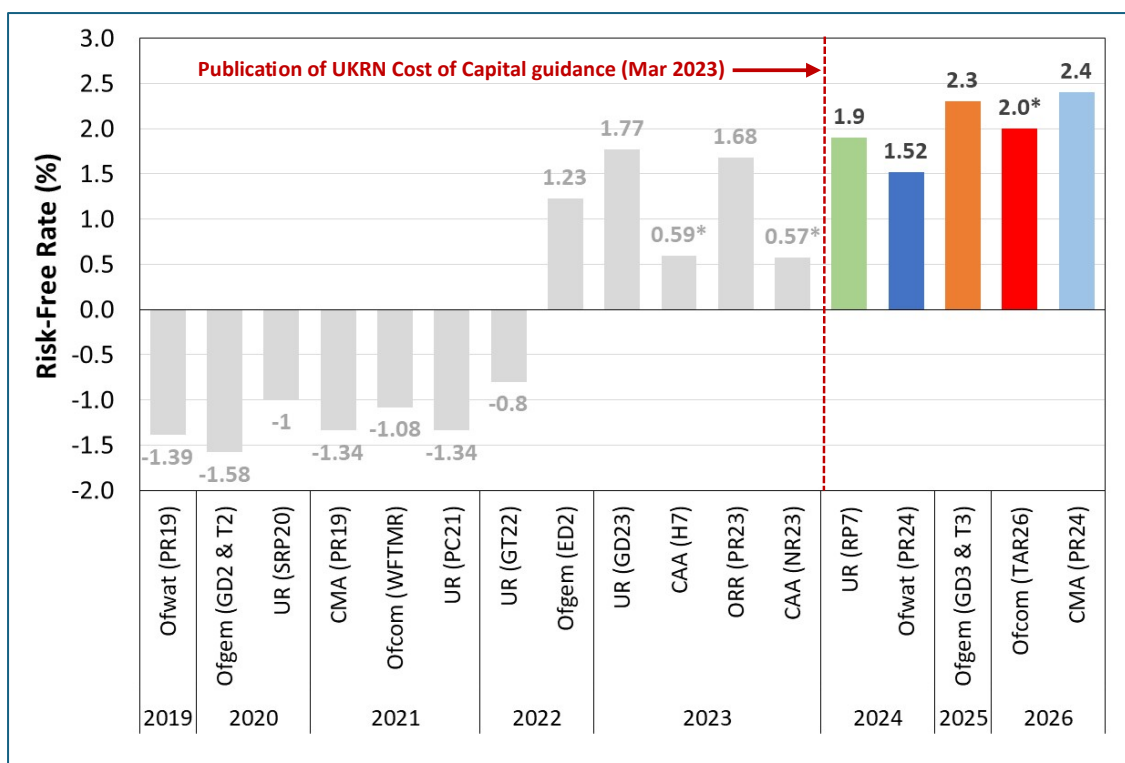
32. Where a change in notional gearing is proposed, regulators should consider the mechanics of how this is achieved by the notional company, and (where appropriate) provide funding for the mechanisms that are required (e.g. equity injections).

### 3. Risk-free rate

**Recommendation 4:** *To estimate the real risk-free rate (RFR) within the CAPM, regulators should use recent yields on index-linked gilts, with a maturity which matches the assumed investment horizon for their sector.*

33. Under the CAPM framework, the risk-free rate (RFR) is the return required for an asset that is free of systematic risks. Given that such an asset does not exist in practice, textbooks, practitioners and regulators have tended instead to use the yield on the safest assets – typically index-linked government bond yields – as a proxy for the true risk-free rate.

**Figure 2: Risk-free rate from recent price control decisions (% real, CPIH)**



\* Ofcom risk-free rate estimated on RPI basis, rather than CPIH basis

Source: UKRN Cost of Capital Annual Reports

### Current approach

#### Choice of proxy

34. Particularly since the PR19 CMA panel's March 2021 redetermination (which placed some weight on AAA-rated corporate bonds), there has been a debate as to whether index-linked gilt (ILG) yields represent the best proxy for the RFR in the CAPM, and whether ILG yields can be improved as an RFR estimate by placing weight on the yields of other instruments or by applying adjustments to reflect a 'convenience

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yield'.<sup>26</sup> Decisions by UR (GT22 (2022), GD23 (2023), RP7 (2024)) and CAA (H7 (2023), NR23 (2023)) placed weight on AAA-rated corporate bond yields as well as ILG yields.

35. More recently, regulatory policy has been characterised by the sole use of ILG yields to inform the risk-free rate, with decisions from Ofcom (TAR26 (2026)), Ofgem (RIIO-3-ET/GD/GT (2025)), CAA (H8 Initial Proposal (2026)), and the CMA (PR24 (2026)) electing to base the RFR assumption on ILG yields alone.
36. The maturity of ILG chosen has tended to match the relevant investment horizon in the sector in question, commonly falling in the range of 10-20 years.

### *Inflation issues*

37. Inflation indexation regimes in regulators have been converging over time to a CPIH basis (currently this is the case for Ofwat, Ofgem, CAA and UR), with Ofcom generally retaining a nominal regime. As a CPIH-based indexation regime requires a CPIH-real WACC, this currently requires regulators to estimate an RPI-CPIH 'wedge' to convert RPI-linked ILG yields to a CPIH basis.
38. In line with the 2023 guidance, regulators have drawn on both swap-based<sup>27</sup> and official forecasts-based<sup>28</sup> approaches to derive an RPI-CPIH 'wedge', typically under the simplifying assumption that an RPI-CPI 'wedge' can proxy for the RPI-CPIH 'wedge', given the broadly close historical relationship between CPI and CPIH. The size of this 'wedge' has reduced over time with the approach of the planned 2030 date for RPI reform, consistent with the expectation that RPI-linked bonds will effectively be indexed to CPIH from this point onwards.

### *Mitigating forecast error*

39. Regulators have adopted different approaches to improving the accuracy of the RFR assumption, given that market conditions may change over the course of the control period. Ofgem and UR have moved to index the RFR assumption for electricity and gas networks, such that its allowed return on equity in affected controls is updated for more recent market evidence. In contrast, other regulators currently adopt a fixed-RFR assumption over the given control period.<sup>29</sup> Some regulators have also historically chosen to use forward rates<sup>30</sup> to uplift this recent yield. This practice has

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<sup>26</sup> The idea of a convenience yield reflects the notion that certain safe assets (e.g. government bonds) exhibit 'money-like convenience' properties (e.g. usefulness as collateral) that provide value to investors and hence move the market yield away from the true risk-free rate.

<sup>27</sup> i.e. the difference between the RPI and CPI swap rate at the same maturity of ILG used.

<sup>28</sup> e.g. the average difference between official forecasts of RPI and CPI.

<sup>29</sup> For instance, for PR24, Ofwat decided against RFR indexation due in part to companies arguing that they valued the predictability and stability of a fixed return on equity allowance

<sup>30</sup> The implied rate rise over the course of the control period embedded in the current term structure of the real gilts curve.

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however now fallen out of favour due to concerns over the poor predictive power of forward rates.

40. The data cut-off and length of averaging window chosen to inform the risk-free rate are an important determinant of the RFR figure, capable of driving material differences between sectors even where the choice of risk-free proxy is the same. While it is commonly agreed that more recent data is more likely to be reflective of interest rate conditions in the ensuing control period, short averaging windows may also capture atypical volatility which may result in a distorted and unrepresentative estimate. In recognition of these considerations, regulators have recently tended to take a relatively short (1 to 6 months), and recent trailing average of relevant yields.

### Risk-free rate: guidance

#### *Choice of proxy*

41. Regulators continue to consider yields on ILGs to be the closest observable proxy to the true risk-free rate, based in particular on the following rarely-observed characteristics: inflation protection, ultra-low default risk, and ultra-low liquidity risk.
42. While noting arguments that ILG yields may represent an imperfect estimate of the true RFR (due, for example, to a 'convenience yield'),<sup>31</sup> a key consideration is whether the use of other proxies can improve this estimate. It is not clear that this is the case. While other proxies (e.g. nominal gilts, AAA-rated corporate bonds) can in principle be used to derive an estimate of the RFR, the presence of a wider range of risk premia (and the greater materiality of said premia) in these proxies suggests a risk they may add more noise than signal to regulators' efforts to identify the true risk-free rate.
43. Challenges to the suitability of ILG yields as a risk-free proxy have contributed to a growing number of alternative approaches, including reliance on alternative CAPM frameworks (e.g. the Brennan CAPM),<sup>32</sup> and nominal and index-linked AAA bonds and indices (with and without duration matching).<sup>33</sup> These alternative approaches add complexity and are themselves not free of drawbacks.<sup>34</sup> Recent evidence indicates placing weight on AAA-rated bonds may also not lead to a materially different RFR estimate compared to using ILGs alone.<sup>35</sup> Given these issues and

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<sup>31</sup> This refers to the notion that the money-like convenience of holding safe assets like gilts is a source of value to investors, potentially depressing the yield of such assets below the risk-free rate.

<sup>32</sup> Brennan M J, 'Capital market equilibrium with divergent borrowing and lending rates' (1971), available [here](#).

<sup>33</sup> Duration is the weighted average time it takes to receive a bond's cash flows

<sup>34</sup> For instance difficulties in finding duration-matched AAA-rated bonds relevant to the long (e.g.20y) horizons used by regulators.

<sup>35</sup> CMA, 'PR24 Final Determinations Volume 4: Allowed return', March 2026, para 7.297



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external calls for greater consistency in approach, regulators see value in retaining the established approach to using ILG yields to proxy for the RFR.

44. The case for relying on ILG yields is strengthened by planned 2030 RPI reforms, which look set to effectively convert the indexation of ILG yields to CPIH (consistent with how most regulators index their real-terms controls). This would remove the need for regulators to estimate an RPI-CPIH 'wedge', and thus another potential source of estimation inaccuracy.
45. This guidance does not currently support applying a 'convenience yield' adjustment to ILG yields. This is firstly due to the gap in empirical evidence on the convenience yield embedded in UK gilts at the long (i.e. 10-20 year) horizons typically used by regulators. Secondly, the normalisation of monetary policy and greater supply of government bonds may have reduced any embedded convenience yield in gilts, potentially to the point that it is negative.<sup>36,37</sup> Using a positive adjustment to control for a potential distortion of uncertain sign, whose value is liable to move over time, raises the risk that this could reduce (rather than improve) the accuracy of ILG yields as a proxy for the RFR.
46. This guidance continues to recommend that the maturity of ILG chosen to inform the RFR assumption should align with the CAPM horizon used in regulators' respective sectors (typically 10-20 years).

### *Inflation issues*

47. This guidance continues to recommend that regulators should use their own judgment when deciding the weight to be placed on swap-based and official forecasts-based evidence, as neither source of evidence is clearly preferable.
48. Swap-based inflation has the advantage of being a market-based expectation that is available at the same maturity of ILG used by regulators (typically 10-20 years). As the RFR assumption is an expected return, it is correct to deduct expected inflation at the same horizon. However, one drawback is that CPIH swap rates are not currently available, and the assumption that CPI is equal to CPIH has been challenged by the OBR view that there is a CPIH-CPI 'wedge' of around 0.4% over the long term.<sup>38</sup>
49. The OBR currently produces long-run forecasts of RPI and CPIH which can be transformed into a geometric average over the maturity of the instrument in

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<sup>36</sup> Isabel Schnabel "[No longer convenient? Safe asset abundance and r\\*](#)," Keynote speech at Bank of England BEAR Conference, February 2025

<sup>37</sup> Du, Et al, 'Quantitative Tightening Around the Globe: What have we learned?', NBER Working paper 32321, April 2024

<sup>38</sup> Office for Budget Responsibility, '[Economic and fiscal outlook](#)', October 2024, p. 38, Box 2.3.



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question.<sup>39</sup> As these forecasts are not derived from market processes, it is however not clear that they reflect the market's expectation of inflation over this period.

50. It is anticipated that for charging years following RPI reform transition in 2030, regulators operating CPIH controls will be able to use ILGs to directly proxy for a CPIH-real RFR, without the need for an RPI-CPIH 'wedge'.

### *Mitigating forecast error*

51. RFR indexation offers the prospect of reducing forecast risk, as the RFR assumption would be linked to changes in yields of the underlying proxy. Combined with the use of the same proxy, greater take up of this approach would also increase the consistency in the numerical level of RFR assumption across regulated sectors at any given point in time.

52. Despite these positives, indexation has not universally been welcomed by regulated companies and their investors,<sup>40</sup> and the greater sensitivity of bills to ILG yields may be detrimental to some customer groups. For these reasons, this guidance recommends regulators should base any decision to adopt indexation on consultation with sector stakeholders and analysis of the impacts – which may differ across sectors.

53. This guidance does not recommend applying a forward-rate adjustment to gilt yields. Forward rates have been shown to have poor predictive power over the path of future spot rates and therefore are not liable to increase the accuracy of the RFR assumption.<sup>41</sup>

54. One simple way of reducing forecast error is to use a relatively recent data cut-off for deriving the risk-free rate assumption. While not formalised in the 2023 guidance, this iteration proposes that the data cut-off informing the RFR assumption should be no more than 6 months from the publication of final determinations.

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<sup>39</sup> See for instance: [Supplementary forecast information release: Long-term economic determinants – March 2026 - Office for Budget Responsibility](#)

<sup>40</sup> For instance, Ofwat found at PR24 the majority of regulated companies consulted (10 out of 17) opposed it (see p19 [PR24-and-beyond Discussion-paper-on-risk-and-return.pdf](#))

<sup>41</sup> CMA, 'PR24 Final Determinations Volume 4: Allowed return', March 2026, para 7.188

## 4. Equity risk premium

**Recommendation 5:** *[This recommendation is under review pending the outcome of this consultation]*

55. Under the CAPM framework, The Total Market Return (TMR) measures the return expected by the marginal investor from holding a diversified portfolio of securities ('the market portfolio'). While in principle the market portfolio should include all investible securities, regulators have pragmatically tended to use a broad index of sterling-denominated equities as a suitable proxy, for instance the UK FTSE-All Share.

56. The Equity Risk Premium (ERP) is the difference in expected return between the TMR and the RFR. It denotes the additional compensation that investors require from being invested in the market compared to the risk-free asset. It is an important input to the CAPM as the ERP, when multiplied by the beta of a given company, denotes the risk premium of that company above the RFR.

57. There is no universally-accepted approach to estimating TMR, in part owing to the difficulties in validating the predictive power of approaches against 'true' TMR – which is a largely unobservable return expectation. Over time, three distinct groupings of approaches have emerged in UK regulatory practice:

- **'Historical ex-post'** approaches use observed historical equity returns as a benchmark for investors' current expectations for TMR.
- **'Historical ex-ante'** approaches also rely on realised historical equity returns but recognise that expected returns are likely to have been different. This perspective therefore aims to strip out historical factors driving returns, which are unlikely to be repeated in future.
- **'Forward-looking'** approaches use more recent market data, such as current market valuations, and/or surveys of market practitioners to infer the expected rate of return on the market index.

58. Internationally, two approaches to estimating ERP from historical data predominate:

- **The 'Stable TMR' approach** – this assumes long-run TMR is broadly stable and derives ERP as the long-run average TMR minus a recent estimate of the RFR.
- **The 'Stable ERP' approach** – this assumes long-run ERP is broadly stable and derives ERP directly, as a long-run average of the difference between in-year TMR and in-year RFR for the same year.

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### Current approach

59. All UK regulators currently focus on historical approaches and the 'Stable-TMR' approach, and have done so for several control periods. This is an approach endorsed by the UKRN-commissioned Wright et al. (2018) study on allowed return estimation,<sup>42</sup> as well as previous studies,<sup>43</sup> which have found the empirical basis for treating the forward-looking ERP as stable (i.e. 'stable ERP') to be weak, and the basis for a stable TMR stronger. Consistent with the conclusions of the 2018 study, 'forward-looking' approaches are not used as a primary approach by any regulator, because the subjectivity around model inputs<sup>44</sup> drives considerable uncertainty around the TMR estimates yielded by such approaches.
60. The key dataset for historical TMR approaches is the Dimson, Marsh & Staunton (DMS)-curated dataset, featured annually in the UBS Global Investment Returns Yearbook. This provides UK equity returns from 1900 up to the most recent completed calendar year. It is widely agreed between regulators and regulated companies that the appropriate inflation series for deflating to a CPIH basis is the 'CPIH-CED' composite series.<sup>45</sup>
61. Overall, as set out in Figure 3 below, estimates of regulatory TMR have converged over time, with determinations in the 3 years following publication of the guidance lying in a narrow range of 6.7% to 7.0% (real, CPIH).

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<sup>42</sup> Wright et al., '[Estimating the cost of capital for implementation of price controls by UK Regulators](#)', 2018

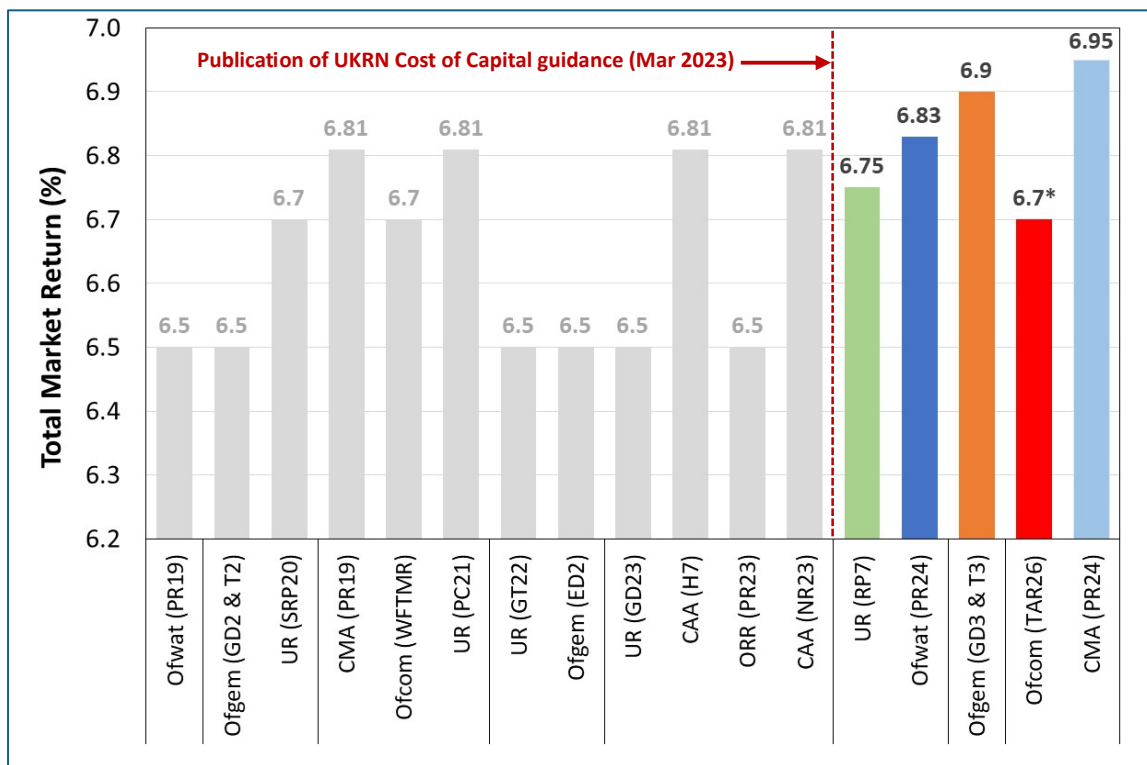
<sup>43</sup> See e.g. Wright and Smithers '[The Cost of Equity Capital for Regulated Companies: A Review for Ofgem](#)', 2014 pp. 13-16

<sup>44</sup> For instance, the choice of dividend growth rate, for dividend discount models (DDMS).

<sup>45</sup> For 1900-1949 this is based on the Consumption Expenditure Deflator developed by Feinstein (1972), for 1950-1988 it is based on ONS' 2022 modelled back series of CPIH, and for 1989 onwards it is based on the official ONS CPIH all items series.

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**Figure 3: Total Market Return from recent price control decisions (% real, CPIH)**



\* Ofcom Total Market Return estimated on CPI basis, rather than CPIH basis

Source: UKRN Cost of Capital Annual Reports

### 'Historical ex-post' approaches

62. The 'ex-post' perspective assumes that the marginal investor expects returns that resemble historical returns. A long run of data is typically used to avoid embedding bias from particularly benign or inclement historical periods for investors.

63. Recent regulatory practice has placed weight on several classes of estimator, including:

- **Overlapping and non-overlapping arithmetic estimators**, which divide up the c.125-year history of DMS into discrete 'holding periods' (e.g. 20 years), for which the geometric average return is calculated and then an arithmetic average is taken of the averaging windows. Overlapping estimators permit overlap in the range covered by averaging windows, while non-overlapping estimators do not (resulting in fewer datapoints). Longer holding periods of 10-20 years have typically been preferred to match the long horizon of utility sector investments and to mitigate the effect of potential serial correlation in the returns data.<sup>46</sup>
- **Horizon-weighted academic estimators**, which estimate TMR as a weighted average of geometric and arithmetic estimators, depending on the length of

<sup>46</sup> The presence of serial correlation means the one-year holding period arithmetic average is liable to be an upwardly-biased estimator of the 'ex-post' return expectation.

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forecast horizon (e.g. 'Blume' or 'Cooper' estimators). The authors of these estimators argue they improve on the simple arithmetic estimator by reducing bias and inefficiency at longer horizons. They also require an assumption around whether the forecast is from an investor or capital budgeting perspective.

- **Geometric-to-arithmetic estimators**, which draw on a mathematical approximation proposed in the 2018 Wright et al. study of converting long-run geometric averages to an arithmetic estimate.<sup>47</sup> This approach benefits from being more robust to changes in exchange rates over time.<sup>48</sup>

### *'Historical ex-ante' approaches*

64. The 'ex-ante' perspective draws on a body of academic literature which argues that investors likely did not expect the returns that they achieved in the second half of the 20th century<sup>49</sup> (a phenomenon sometimes referred to as the 'Equity Premium Puzzle'). This is relevant, as the required input for TMR is a return expectation.

65. Recent regulatory practice has tended to focus on two approaches to identify a forward-looking return expectation:

- **The Fama-French approach:** a dividend growth model, which decomposes historical returns into an underlying expected return (the average dividend yield plus the average dividend growth rate), and an unexpected return (capital gain in excess of dividend growth).
- **The DMS Decompositional approach**, which uses DMS UK equity return data to decompose the historical equity risk premium into those elements which seem likely to repeat in future and those which do not.

### *'Stable-ERP' approaches*

66. For its March 2026 final determination, the PR24 CMA panel chose to depart from the established 'Stable-TMR' approach, and place weight on 'Stable-ERP' evidence as a primary TMR datapoint. This was due to its view that the stability and narrowness of the TMR range under 'stable-TMR' approaches did not leave sufficient flexibility to reflect changes in macroeconomic conditions in the allowed return on equity.<sup>50</sup> It also argued that the decomposition of an asset's required return into a risk-free rate and a risk-premium component was familiar from asset pricing models

<sup>47</sup> This relies on the finding that the approximate difference between the geometric and arithmetic averages for a lognormally distributed series will be half the variance of log returns.

<sup>48</sup> S.Wright et al. '[A study into certain aspects of the cost of capital for regulated utilities in the U.K.](#)', February 2003, pp24-27

<sup>49</sup> E.g. Mehra R., Prescott C., 'The equity premium: a puzzle', Journal of Monetary Economics, March 1985

<sup>50</sup> CMA, 'PR24 Final Determinations Volume 4: Allowed return', March 2026, para 7.398

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and investor behaviour in practice,<sup>51</sup> and UK regulators had previously used 'stable-ERP' approaches in past controls.<sup>52</sup>

67. Finally, it considered that the step up in required water investment for PR24 meant that the perspective of new investors was an important consideration, independently of whether the framework was fair over time for legacy investors, who likely experienced benefit from a 'stable-TMR' approach in the low-interest rate period of the 2010s.<sup>53</sup>

68. The PR24 CMA panel's choice of estimator was based on adding its estimate of the risk-free rate (2.40% real, CPIH) to the simple arithmetic average of a series constructed of the in-year difference between DMS data on the CPIH-real equity return and the return on a government bond portfolio.

### Equity risk premium: guidance

69. This guidance provisionally recommends that regulators should continue to use 'ex-post' and 'ex-ante' approaches assuming a stable TMR as primary datapoints to inform the TMR range. These approaches support a stable and predictable estimate of TMR and are transparent, relying on publicly available data and relatively simple calculations. Given their established use across UK economic regulators, continuation of these approaches supports consistency over time and across regulators.

70. The well-established DMS dataset should remain the source for the data used in these approaches, deflated using the established CPIH-CED composite inflation series. Although this series is not without its weaknesses, it is plausibly the most robust historical inflation series available over the last 125 years, and results in a CPIH-real TMR estimate aligned with the CPIH-real controls that most WACC-setting regulators have moved to.

71. In response to the PR24 CMA panel's suggestion that a 'targeted review' of the established TMR methodology could be beneficial, in this consultation we invite views from stakeholders on the merits of placing weight on ERP evidence, including ideas for particular approaches which might be suitable. If estimates based on these approaches were accepted as primary datapoints, it is envisioned they could be converted to TMR estimates through adding an estimate of the RFR to the estimate of the ERP. They could then be used to inform the overall TMR range. The UKRN working group of regulators will consider submissions alongside their own analysis to alight on a recommendation in this area for the final guidance.

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<sup>51</sup> CMA, 'PR24 Final Determinations Volume 4: Allowed return', March 2026, para 7.408

<sup>52</sup> CMA, 'PR24 Final Determinations Volume 4: Allowed return', March 2026, para 7.426

<sup>53</sup> CMA, 'PR24 Final Determinations Volume 4: Allowed return', March 2026, para 7.424

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### *Ex-post approaches*

72. Regulators have in recent years relied to differing extents on the 'ex-post' approaches set out in the prior section.<sup>54</sup> While this period has nonetheless been characterised by convergence in the point estimates used by regulators, the number of approaches adds to the complexity of the regulatory environment, with potential detriment to transparency and predictability of allowed returns.

73. The range of approaches has been underpinned in particular through arguments that UK equity returns are serially correlated, and arguments in favour of either the portfolio investor or capital budgeter perspectives being most relevant. Yet exploration of these issues has not led to a settled outcome, with empirical evidence proving somewhat inconclusive.

74. For these reasons, this guidance provisionally endorses a simpler and more transparent approach to 'ex-post' TMR estimation based on the use of the 1-year holding period arithmetic estimator.

### *'Ex-ante' approaches*

75. This guidance provisionally recommends that regulators should continue to place weight on the Fama French and/or DMS decompositional approach cited in this chapter, recognising the strong theoretical basis for including these approaches, and their long track record of use in UK regulation.

### *ERP-based approaches*

76. Direct validation of 'stable-TMR' approaches with empirical evidence is difficult, as true TMR is an unobservable return expectation. However, the accuracy of 'stable-TMR' estimates seems more challengeable in periods of unusually high or low interest rates, due to the implicit assumption that changes in RFR are not accompanied by changes in TMR. For instance, estimates of the allowed return on equity based on 'stable-TMR' approaches may align poorly against debt-to-equity cross checks, as they may have improbably low spreads over cost of new debt benchmarks in periods of high interest rates.

77. The interplay of equity beta and changes in interest rates under 'stable-ERP' approaches may also give rise to potentially counterintuitive scenarios:

- For firms with a re-levered beta above 1: The CAPM cost of equity **decreases** in response to increases in the RFR.<sup>55</sup>

<sup>54</sup> For instance Ofwat's PR19 explicitly considered all these approaches, while Ofgem's RIIO-3 (ET/GT/GD) placed sole reliance on the 1-year holding period arithmetic average.

<sup>55</sup> More formally, the rate of change is  $(1-\beta) * (\text{change in RFR})$ .



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- For firms with a re-levered beta of exactly 1: The CAPM cost of equity does not change in response to the RFR.
- For firms with a re-levered beta below 1: The CAPM cost of equity **increases** in response to increases in the RFR (but far less than one-for-one).<sup>56</sup>

78. The first two scenarios seem particularly difficult to square with the intuition and evidence. As noted in the 2023 guidance, there is some evidence of a positive relationship between real interest rates and real returns on equity, for instance as shown in the DMS Yearbook.<sup>57</sup> In addition, some dividend discount model outputs using UK data suggest a correlation coefficient between ERP and RFR that is less steep than the -1 (i.e. perfectly negatively correlated) coefficient implied by the 'stable-TMR' approach.<sup>58</sup>

79. Despite these issues, this guidance does not recommend a wholesale switch towards 'Stable-ERP' approaches (which would in effect revert to the pre-2010 consensus among regulators). This is because 'Stable-ERP' approaches also seem to struggle to faithfully represent true TMR in periods of exceptionally low or high interest rates, and 'Stable-ERP' regimes have tended to respond in a variety of hard-to-predict ways to correct the perception of a too-low allowed return on equity that resulted in the 2010s.<sup>59</sup>

80. Given that the indicative direction of bias of both 'Stable-TMR' and ERP-derived approaches seems to be countervailing,<sup>60</sup> there may be merit in considering a hybrid approach to TMR estimation placing weight on both approaches. This consultation accordingly seeks views from stakeholders on the following specific questions:

**Question 2:** *When determining the range for TMR, to what extent should UKRN members place weight on estimates of TMR derived additively from estimates of the ERP combined with the RFR?*

**Question 3:** *If supportive of placing weight on TMR estimates relying on ERP, which approaches to estimating ERP should UKRN members consider adopting?*

<sup>56</sup> As with the first scenario, the rate of change is  $(1-\beta) * (\text{change in RFR})$ .

<sup>57</sup> The authors conclude that “when real interest rates are low, expected future risky-asset returns are also lower”. Source: Dimson et. al 'Credit Suisse Global Investment Returns Yearbook,' 2022, p.69

<sup>58</sup> PWC found that for data from 2000-2016, the correlation coefficient between RFR and ERP was -0.76. See footnote 144 of PWC, '[Refining the balance of incentives for PR19](#)', p78, June 2017

<sup>59</sup> For instance, post-2008 ARERA applied a RFR 'floor' to prevent negative rates, despite evidence that reference government bond yields were indeed negative. See ARERA (2015) Technical report. Available on: [583-15rt.pdf](#)

<sup>60</sup> E.g. 'Stable-TMR' approaches tend to overstate TMR in periods of low rates, while 'Stable-ERP' approaches tend to understate TMR in the same conditions.

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81. Our overall objective in soliciting responses is an approach to estimating TMR which is liable to be more accurate over time, and better able to cope with large shifts in interest rate changes of the size we have observed in the previous two decades.

82. While noting that the PR24 CMA panel's use of a 'Stable-ERP' estimator does implement a hybrid approach in practice, there are some issues to consider that were not fully addressed in the PR24 CMA panel's final report. These issues include:

- **Poor-quality RFR data:** The CMA's 'stable-ERP' estimator is liable to be a noisy (and potentially biased) estimator of true ERP, because the RFR input is the DMS-derived return on a portfolio of government bonds, and so is not risk-free. This is because the returns include capital gains and losses, implying exposure to interest rate risk. In contrast, the yield-to-maturity of an ILG (which assumes it is held to maturity) does not exhibit this risk exposure. Index-linked gilts only started being issued in 1981, and so a RFR that is consistent with the recommended definition in this guidance is not available for the entirety of the c.125-year equity returns series featured in DMS. This raises the question of whether better sources of historical RFR data exist to inform long-run ERP.
- **Range of ERP estimators:** There is a wide range of approaches to estimating ERP, of which the CMA's approach represents just one. While the CMA panel intended for its estimator to better reflect recent financial conditions, 2024 measures of ERP using recent data (e.g. options-implied ERP and CAPE<sup>61</sup> analysis) have yielded significantly lower figures than the CMA's long-run average.<sup>62</sup> This raises the question of how evidence from these approaches should be combined (if at all) with the 'Stable-ERP' approach, to define estimates of ERP.
- **Instability of ERP:** Evidence set out in this chapter suggests there may be a less than one-for-one relationship between the RFR and ERP. As the CMA approach assumes stability in the historical ERP irrespective of changes in the RFR, this is a potential source of estimation error which overstates the passthrough of RFR to TMR (and thus the allowed return on equity). This raises the question of whether the 'Stable-ERP' estimate should be adjusted before being used to determine the TMR range – potentially using evidence on the correlation between RFR and ERP.
- **Volatility in the CAPM cost of equity:** As set out in Figure 4 below, indicative TMR under a 'Stable-ERP' approach is more volatile than its 'Stable-TMR' counterpart, and the overall CAPM cost of equity estimate is liable to take on some of this volatility under a hybrid approach. As this volatility would be driven

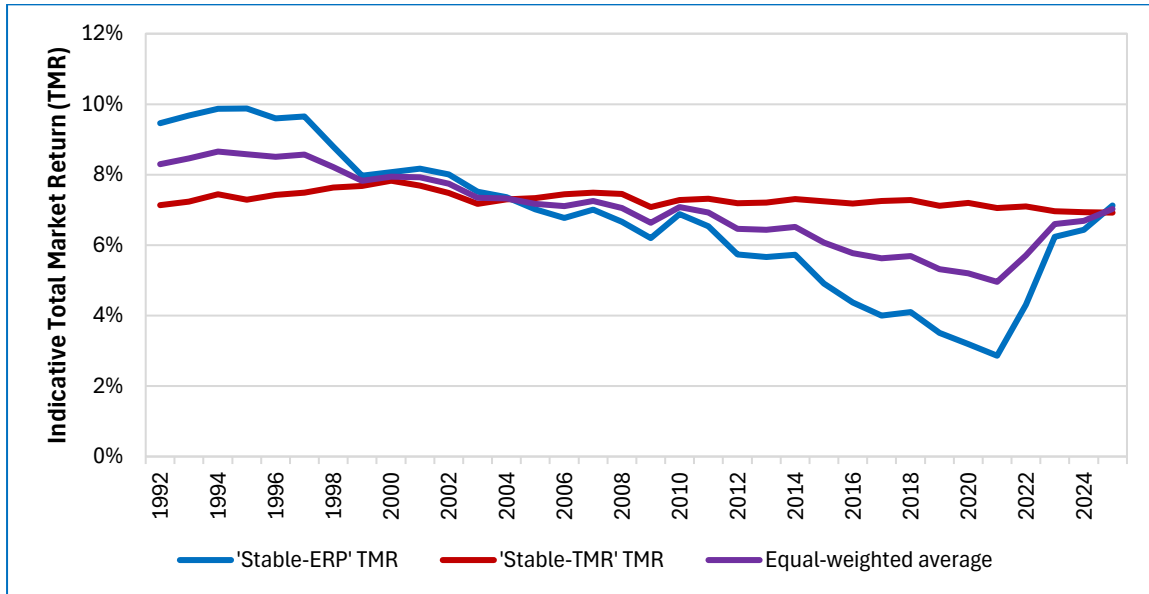
<sup>61</sup> Cyclically Adjusted Price to Earnings ratio

<sup>62</sup> See Bank of England, '[How stretched are equity prices? Evidence from option-implied estimates of equity risk premia](#)' Published on 14 January 2025

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primarily by changes in the RFR (which is difficult to forecast), it would result in an allowed return that is both less stable and predictable. This raises the question of whether greater weight should be placed on 'Stable-TMR' in a hybrid approach, if stability is a desired outcome.

**Figure 4: Indicative Total Market Return (TMR) for PR24 CMA 'Stable-ERP' and 'Stable TMR' (ex-post) approaches (real, CPIH)<sup>63</sup>**



Source: UKRN analysis of DMS data and CMA PR24 provisional determinations.

83. These issues are likely to have some overlap with wider considerations in featuring ERP evidence. The UKRN working group therefore welcomes stakeholder views on how to account for them in the final proposed guidance.

<sup>63</sup> Note: 'Stable TMR' is an extending trailing average of 1y holding period arithmetic average 'ex-post' TMR 'Stable ERP' is an extending trailing average of the PR24 CMA panel's 1y holding period estimated ERP plus a RFR assumption based on calendar year-average 20y ILG yields. RPI-CPI(H) wedge is assumed to be 0.5% pre-2010, 1.0% 2010-2020, and figures between 2020 and 2025 interpolate between 1.0% and the CMA's 0.21% 'wedge' for its FD.

## 5. Equity beta

**Recommendation 6:** *Regulators should estimate equity beta for the notional company using comparable listed companies and standard regression techniques (i.e. ordinary least squares (OLS)). Where the listed comparator has different gearing to the notional company, regulators should continue to de-lever and re-lever the raw equity beta.*

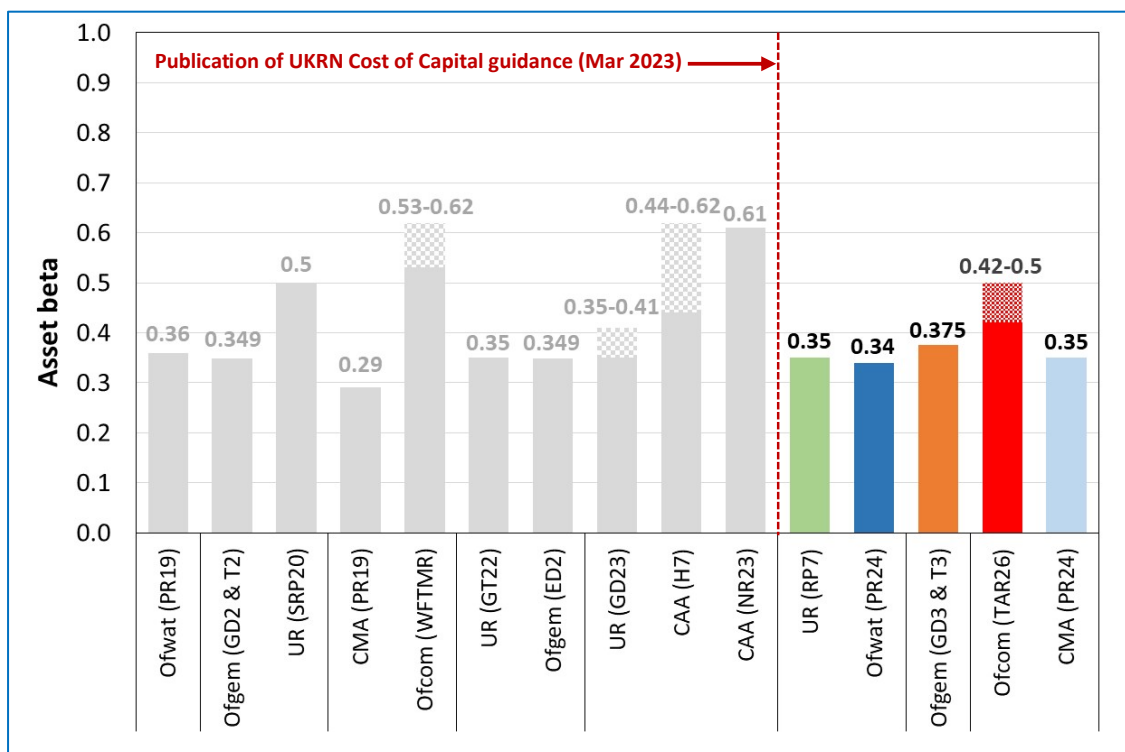
84. The final component of the cost of equity in the CAPM is the equity beta, which is the only firm- or sector-specific parameter in the CAPM. For given values of the common parameters for the cost of equity (i.e. RFR and TMR), it is the choice of equity beta that would be the main driver of differences in the allowed returns on equity between sectors.
85. Equity beta is a measure of the sensitivity of a stock's return to 'systematic' or market-wide risks, measured relative to the aggregate systematic risk exposure of the market portfolio of equities. By definition, the market portfolio has an equity beta of 1. Individual stocks with an equity beta less than 1 are less sensitive to the market and investors require lower returns on such stocks than on the overall market (i.e. the overall cost of equity is less than the TMR). The converse is true for stocks with equity betas above 1.
86. Like the TMR, the equity beta component of the cost of equity is not directly observable but must be estimated, typically using historical data. The most common technique to estimate equity betas is regression analysis of past returns on the listed stock(s) of interest and the market index.
87. Figure 5 below sets out asset betas used in recent regulatory determinations.<sup>64</sup> There is a degree of variation across controls, reflecting the different business risks and regulatory frameworks which apply.

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<sup>64</sup> Asset beta reflects a view of a firm's systematic risk exposure assuming no leverage. Stripping out the contribution of leverage can be helpful to better understand underlying risks.

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Figure 5: Asset betas from recent price control decisions



Source: UKRN Cost of Capital Annual Reports

### Current approach

88. Despite differences in the numerical value of beta used, the broad approach used by UK regulators to estimate beta tends to feature the following steps:

- Identifying listed comparators that can proxy for the notional company which requires an estimate of beta.
- Econometrically estimating raw equity betas for these comparators through an Ordinary Least Squares regression of equity index returns (e.g. FTSE All Share) on those of the stock in question, typically using a range of estimation windows.
- 'De-levering' – i.e. stripping out the impact of gearing on raw equity betas to derive an asset beta using the Harris-Pringle approach.<sup>65</sup> This requires an estimate of gearing and a debt beta. This produces an asset beta – a measure of operating risk, not affected by the financial capital structure choices of each comparator.
- 'Re-levering' – i.e. reflecting the impact of increasing gearing up to the assumed notional threshold on the beta of the comparator. This yields a notional equity beta, which is the input for the CAPM.

<sup>65</sup> The Harris Pringle formula is:  $\beta_a = \beta_e \cdot (1 - g) + \beta_d \cdot g$ , where  $\beta_a$  is the asset beta,  $\beta_e$  is the raw equity beta of the listed comparator,  $\beta_d$  is the debt beta, and  $g$  is gearing, as defined by debt/(debt+equity).

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### *Listed comparators and market index*

89. UK regulated sectors vary significantly in terms of the number and quality of domestic listed comparators. For instance, while there are three listed 'pure play'<sup>66</sup> water companies, there are currently no UK-listed airports or gas networks. Regulators lacking 'pure play' UK comparators from their sector have tended to either place weight on comparators from other sectors or adjust non-'pure play' betas based on qualitative considerations. For instance:

- Ofgem's RIIO-3 placed weight on European energy network betas, in part due to the lack of UK-listed comparators.
- Ofcom's Telecoms Access Review 2026-31 estimated betas for BT's regulated services by reference to betas from BT, UK and European telecoms operators, UK utilities and international ICT companies.
- Ofgem's Decision on amending the EBIT allowance for energy suppliers increased the asset beta range previously featured in CMA analysis, based on limited econometric evidence. Its higher range drew on factors including its assessment that risks to suppliers had increased, as well as changes in one related comparator's asset beta.<sup>67</sup>

90. The choice of market index has tended to follow the currency area of the stock in question. For instance, UK-listed stocks have tended to use a regression involving the FTSE All-Share, while European stocks have tended to be regressed against euro-area indices, such as the STOXX 600.

### *Length of estimation window, and frequency of data*

91. Regulators have recently tended to base their beta ranges on 2-, 5- and 10-year beta estimation windows, as suggested by the 2023 guidance. Not all sectors have been able to derive the full set of windows, as some listed comparators do not have a long enough span of data to do so.

92. The frequencies of data used in recent regulatory decisions has varied, with some regulators favouring the use of weekly and monthly frequency data. Overall, however, there has been a shift amongst regulators towards greater use of daily frequency data as the sole frequency used to provide estimates. This is as (other things equal) daily data tends to result in narrower confidence intervals and avoids the need to control for the 'reference day effect'.<sup>68</sup>

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<sup>66</sup> i.e. companies that operate exclusively, or almost entirely, within a single industry of business segment

<sup>67</sup> Ofgem, '[Price Cap – Decision on amending the methodology for setting the Earnings Before Interest and Tax \(EBIT\) allowance](#)'. August 2023

<sup>68</sup> This is the phenomenon whereby estimates of weekly or monthly beta can vary substantially depending on the day of the week or date in the month used as the data cut-off.

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93. Periods of volatile systematic risk (e.g. Covid-19 lockdowns) have generally been included by regulators in estimation windows on the grounds that these periods likely contain important information about the exposure of the stock in response to systematic risk events and excluding them could bias the econometric estimate of beta. Given the disproportionately high impact of the Covid-19 period on the respective listed comparators' measured beta, the CAA chose to assign lower weight to pre-pandemic data for the H7 and NR23 controls in 2023.

### *Gearing and debt beta*

94. Debt betas are required to convert the unlevered equity beta to an asset beta, which is the measure of business risk with the effect of financial gearing removed. There are several approaches which can be used to estimate the debt beta.

95. The debt beta itself is only important insofar as it aims to ensure that the re-levered notional equity beta is reasonable, given the assumptions on the unlevered operating risk of the notional company and the assumed notional level of gearing.

96. Similar to equity beta, debt beta measures the exposure of debt to systematic risk. The impact of a positive debt beta is dependent on the relative values of listed comparator gearing and notional gearing. Where listed comparator gearing is higher/lower, a positive debt beta will tend to reduce/increase notional equity beta. Where they are identical, the use of a positive debt beta has no effect.

97. In recent decisions, regulators have chosen a debt beta assumption ranging from 0.05 to 0.125. This has largely been a figure determined by prior regulatory decisions and one academic paper,<sup>69</sup> although Ofwat for PR24 commissioned a report which derived a 0.05-0.15 range using several different approaches.<sup>70</sup>

## Equity beta: guidance

### *Listed comparators*

98. Regulators agree that estimates of notional beta should ideally use share price data from listed comparators that closely proxy the features of the notional company. Where 'pure play' listed returns data is not available, this may include using relevant data from listed comparators in other countries and industries, or adjusting econometric estimates of beta for differences in systematic risk exposure between the company of interest and the company providing the beta estimate.

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<sup>69</sup> Schwert and Strebulaev (2014) find that A-rated corporates are associated with a debt beta of 0.05, and those that are BBB-rated a debt beta of 0.10. Source: Schwert and Strebulaev, '[Capital Structure and Systematic Risk](#)', Stanford University Working Paper No. 178, April 2014

<sup>70</sup> FTI, '[Early view of water sector betas for PR24](#)', 30 November 2022

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99. In line with existing practice, the choice of market index for regressions should continue to be a well-diversified equity index in the currency area of the listed comparator (e.g. for UK stocks, the FTSE All Share).

### *Length of estimation window, and frequency of data*

100. The choice of estimation windows requires regulatory judgment at each price control, taking into account available evidence in the round. This notwithstanding, regulators agree there is a benefit in terms of transparency and consistency in using as a starting point data from 2-, 5-, and 10-year windows that are familiar from recent regulatory decisions. This is a simple and transparent approach which maintains consistency over time.

101. This guidance does not recommend statistical breakpoint analysis or dummy variable analysis for determining the length of windows. These approaches tend to be less transparent and more reliant on subjective assumptions. In addition, different specifications of test can yield materially different window lengths.

102. Regulators agree that for estimating equity beta, daily data should be sufficient and carries the advantage of not requiring adjustment for the 'reference day effect'. For thinly-traded stocks, it may be necessary to use lower frequency betas to avoid imparting a downward bias to beta caused by asynchronous trading (sometimes termed the 'Epps effect').

### *Gearing and debt beta*

103. Debt beta is harder to estimate through regression-based approaches than equity beta, due to the thinner trading of bonds. This tends to require the use of lower frequency data (to avoid the Epps effect), which in turn reduces available datapoints and can lead to wider confidence intervals around econometric estimates.

104. Recognising that debt beta will only have an impact on notional beta if the difference between notional and actual gearing is wide, this guidance recommends a proportionate approach. If the impact on the final allowed return on equity is small, an approach based on previous regulatory and/or academic estimates may be appropriate. In contrast, where the allowed return on equity is very sensitive to the debt beta assumption (perhaps because listed comparator gearing and notional gearing are very different), this may call for a more up-to-date and rigorous estimation exercise. The 2019 report by CEPA for UKRN explores suitable alternatives to the standard regression-based (or 'Direct') approach to estimating debt beta.<sup>71</sup>

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<sup>71</sup> CEPA, '[Considerations for UK regulators setting the value for debt beta](#)', report for UKRN, Dec 2019

## 6. Choosing a point estimate

**Recommendation 7:** *The RFR, TMR and (re-levered) equity beta assumptions should be combined using the CAPM to produce a cost of equity range. The mid-point of the range should be used as the point estimate for the CAPM cost of equity.*

**Recommendation 8:** *Cross checks may be used to sense check the CAPM derived point estimate. However, regulators should only deviate from the mid-point of the CAPM cost of equity range if there are strong reasons to do so.*

105. There is uncertainty around the true level of the cost of equity for the notional company. To reflect this uncertainty, regulators typically derive a range for the overall cost of equity and/or its constituent parameters and then pick a point estimate within the range. The choice of a point estimate has usually reflected judgement in the round, rather than an outcome of a specific analytical framework.

### Current approach

106. The 2023 guidance proposed a starting assumption that the distribution of the values in this range is broadly symmetric, with the mid-point of the overall CAPM range representing a suitable point estimate for the CAPM cost of equity (before considering potential reasons why the appropriate point estimate might be different from this midpoint).

107. It then discussed several considerations that have featured in prior determinations when deciding where within the CAPM range to choose the point estimate:

- **Cross-checks from market evidence:** Sense checks to the CAPM's output based on market benchmarks and/or analytical approaches that leverage market data.
- **The welfare impact of under-investment:** The role of the WACC (amongst other mechanisms) in driving investment, and whether the consequences of over- or under-investment are symmetrical from a customer perspective.<sup>72</sup>
- **Asymmetry in the package of incentives:** Whether the broader incentive package has returns which are positively or negatively skewed. In the absence of

<sup>72</sup> It has been argued that the main risk of a too-low allowed return (underinvestment) is worse for customers in terms of lost consumer surplus than the risk of a too-high allowed return (paying more than investors require).

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any intervention, this would imply a realised return on capital above or below the base allowed return on equity, respectively.

- **Asymmetry in the choice of parameters:** Ranges for the individual CAPM parameters rely on a degree of judgement, and it has been argued that it might be inappropriate to assume that the mid-point of the CAPM range is the most likely point estimate.
- **Financeability:** Some regulators model the financial ratios of the regulated entity to assess the adequacy of expected cash flows to service debt payments and to raise new finance on reasonable terms. It has been argued that where modelled cashflow ratios are too low, regulators should adjust the allowed return on equity to remedy this.

108. Regulators have recently adopted this framework to assist in determining the choice of point estimate within the CAPM range. For instance, Ofwat for its PR24 final determination used this framework to justify an allowed return on equity 28 basis points higher than the CAPM midpoint,<sup>73</sup> and the CMA's redetermination of 5 disputing companies' price controls also used this framework to justify a point estimate 30 basis points higher than its midpoint.<sup>74</sup> Ofgem decided for its RIIO-3 (ET/GT/GD) final determination that, after assessing based on this framework, the midpoint of its CAPM range remained the most appropriate choice.<sup>75</sup>

### Choosing a point estimate: guidance

109. This guidance proposes that regulators should build on existing alignment and continue to assess their point estimate for cost of equity against the five considerations set out above. As set out in the 2023 guidance, any decision to deviate from a reasonable mid-point must be justified on a case-by-case basis and supported by clear and convincing evidence.

#### *Cross-checks from market evidence:*

110. Given the CAPM is just one asset pricing model, it may be instructive to make reference to the cost of equity from other frameworks and market evidence. This guidance considers below some of the main types of approaches which have been proposed in recent decisions.

111. **Debt-to-equity cross-checks** are a useful tool for regulators, given the primary approach to TMR estimation is through the 'Stable-TMR' approach, under which the allowed return on equity is less sensitive to interest rate changes. The allowed return on equity should be higher than the allowed return on new debt by a reasonable

<sup>73</sup> Ofwat, 'PR24 Final Determinations: Allowed Return on Capital Appendix', December 2025, pp. 82-84

<sup>74</sup> CMA, 'Water PR24 references, Final Determinations Volume 4', March 2026, p11

<sup>75</sup> Ofgem, 'RIIO-3 Final Determinations – Finance Annex', December 2025, p71, para 3.95

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margin, reflecting that equity carries higher risk (as it is first in line to bear losses). This relatively simple sense check can therefore prevent the approach taken by regulators on TMR from resulting in an allowed return on equity that is excessively dislocated from market requirements. It is, however, important to ensure that inflation is reflected correctly when making comparisons to a regulatory cost of equity that is usually in real terms.

112. **Market-to-Asset Ratios (MARs)** represent the ratio of enterprise value<sup>76</sup> to regulated asset value. They can be used to infer a required base return on equity for listed stocks, for instance by considering what cost of equity could justify a residual MAR premium over regulated asset value, once plausible contributions from price control incentives and growth in value of regulated assets are accounted for. Uncertainty around the true market expectation of contributions from incentives means that this cross-check is unlikely to be able to precisely identify the required return on equity. However, it is liable to provide an indication of where there may be issues with CAPM assumptions (for instance, if there is very little overlap between the CAPM range and MAR-determined range). Finally, the presence (or lack thereof) of a MAR premium (i.e. a MAR above 1.0x) may provide useful information about the broad appetite for equity investment in the sector.
113. **Multi-factor models (MFMs)** represent a relatively new area of research in economic regulation, with comparatively few peer-reviewed and published contributions relating to regulated companies in the UK context. It is not clear that the additional complexity and questions which this family of approaches raises is offset by improvements in the accuracy of estimates of the required return on equity. In particular, additional factor premia and the dynamics of their associated factor betas are less well-understood than the CAPM's TMR and beta, by virtue of their relative novelty. This makes it harder to confidently extrapolate historical relationships to the multi-decade forecasting horizons used by UK regulators. Furthermore, MFMs may be trained on stock market data and assumptions that are relevant to the case of firms in competitive markets, and thus less capable of forecasting required returns for the relatively niche case of economically-regulated utilities.
114. **Top-down cross checks**, such as target internal rates of return (IRR) from investment funds, and allowed returns from international regulated sectors can provide some insight into UK return requirements, but need to be interpreted with care. This is because it is difficult to control for factors affecting the suitability of international comparators, such as differences in regulatory framework. For instance, the c.9-10% nominal return earned by US energy networks has sometimes been cited as a relevant benchmark for UK returns. The read-across of this return to

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<sup>76</sup> Typically calculated as net debt plus market capitalisation.



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the UK context is unclear however, given that in some key respects the US framework provides less inflation protection,<sup>77</sup> and that MAR premia tend to be higher than the UK (1.2-1.8x RAB compared to the 1.0-1.4x RAB more commonly seen in the UK).<sup>78</sup> This suggests that more favourable regulatory treatment (including allowed return) may already be reflected in the higher price that would-be acquirers would have to pay (i.e. they would not be likely to earn the headline allowed return on equity of 9-10%).

115. There has been considerable growth in the number of (and complexity of) market cross-checks proposed by companies in their representations to sector regulators, raising the question of what (if any) weight regulators should place on these cross-checks. While it is beyond the scope of this document to provide a detailed assessment of the merits of each individual approach, this guidance proposes criteria that a good cross-check to the CAPM should display. These are set out below in Table 1, brigaded under the overarching criteria of 'defensibility' and 'implementability' originally proposed in the 2018 UKRN-commissioned study on allowed return estimation.<sup>79</sup> The intention is that these criteria should provide a framework helping regulators to assign appropriate weight to proposed cross-checks and also help companies to make high-quality representations.

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<sup>77</sup> Under the nominal US approach, the asset base is not indexed to inflation each year, and so erodes in real value terms.

<sup>78</sup> Source: [Utility Valuation: P/E, Rate Base Multiples, and Dividend Models | Energy IB](#)

<sup>79</sup> Wright et al., '[Estimating the cost of capital for implementation of price controls by UK Regulators](#)', 2018

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**Table 1: Proposed framework for assessing cost of equity cross-checks**

Defensible	Implementable
<p><b>Independent of the CAPM:</b></p> <ul style="list-style-type: none"> <li>• Cross-checks should be based on a genuinely fresh perspective in order to assess the CAPM-determined allowed return</li> </ul>	<p><b>Reliable:</b></p> <ul style="list-style-type: none"> <li>• Inputs to derive results are easily obtainable by regulators</li> <li>• Results should be replicable</li> <li>• Capable of providing credible estimates across a range of financial environments</li> </ul>
<p><b>Track record &amp; theoretical support:</b></p> <ul style="list-style-type: none"> <li>• Supported by economic or financial theory</li> <li>• Track record of use by financial practitioners in academia or industry</li> <li>• Well-tested and any limitations or anomalies are understood and explained</li> </ul>	<p><b>Proportionate:</b></p> <ul style="list-style-type: none"> <li>• Cost of deriving estimates from cross-checks should be reasonable and proportionate to the costs of deriving CAPM estimates</li> </ul>
<p><b>Transparent and objective:</b></p> <ul style="list-style-type: none"> <li>• Approach, data, assumptions &amp; calculations should be clear, observable, verifiable and free of bias or predetermined outcomes</li> <li>• Results should be explainable to stakeholders</li> </ul>	

### *Welfare impacts from underinvestment*

116. The decision to select a point estimate above the midpoint for customer welfare reasons is one which needs careful consideration based on the characteristics of the price control in question.

117. The allowed return is likely to be a relevant consideration influencing investors' decisions to invest, but it is not the only one:

- **Amount of new investment required:** while companies may be able to weather periods of a sub-market allowed return through relying on retained earnings, the flexibility to do so is reduced when investment needs are large and thus more likely to require new equity (as opposed to being funded through retained earnings).
- **Statutory requirements:** significant investment is driven by statutory requirements or official planning exercises, as opposed to purely commercial motivations. Failure by regulated companies to fulfil their statutory duties can result in enforcement action and could ultimately result in them forfeiting control

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of the license to operate, which is a powerful incentive against under-investment.

- **Service delivery incentives:** regulators increasingly rely on service delivery incentives to reduce the risk of under-investment (e.g. in general maintenance, asset health and in circumstances where spend is discretionary). Such incentives may mitigate the risk of under-investment in existing infrastructure.
- **Separate treatment of large one-off projects:** it may be possible to treat new investments separately from existing assets within the price control, where the cost of capital is set by a market exercise. For example, Ofwat makes use of the Direct Procurement for Customers (DPC) delivery model, in which water companies seek bids from third parties to design, finance, operate and build new infrastructure.
- **Pricing freedom for new investments when competing infrastructure and/or regulation of legacy services constrains market power:** for example, in recognising the scale of investment required for gigabit-capable networks and the scope for competing network build in many parts of the country, Ofcom has allowed Openreach pricing freedom on most fibre broadband services, with anchor pricing (a safeguard cap) on the entry-level superfast broadband service. This approach allows scope for returns above the cost of capital on the new investment, in order to offset the risk that demand in future turns out to be insufficient to allow for recovery of the upfront investment. There are also other features of the regulatory model which are favourable towards maintaining incentives to invest, such as the use of uncertainty and cost reconciliation mechanisms that provide remuneration for efficient investment.

### *Asymmetry in the package of incentives*

118. It has been argued that the cost of equity should be adjusted where the incentive regime leads to a downward skew in expected returns, suggesting that an efficiently-run company may not earn its cost of equity.<sup>80</sup> For instance, penalty-only incentives (all other things being equal) may imply a downward skew to returns, as there is potential for downside risk without any prospect of offsetting upside risk.

119. We recommend that any analysis of asymmetry in the regulatory incentive package should consider:

- The range and skew of penalty incentives in the overall package; and
- the distribution of expected performance against which incentives are applied.

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<sup>80</sup> This follows from the usual regulatory convention that the base return is the cost of capital for a notional company.

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120. An assessment of the overall package is often instructive, as drivers of skew that are negative and positive at the level of individual incentives can at the package level offset each other. In general, it is preferable for regulators to address issues of asymmetry in the incentive package 'at source' (i.e. by adjusting incentives, not the allowed return on equity). This is because the impact of asymmetry is often uncertain, thus complicating efforts to accurately calibrate an allowed return adjustment that offsets this impact.

### *Asymmetry in the choice of parameters*

121. Where possible, we consider that any potential parameter asymmetry could be addressed in the choice of individual parameter ranges. Especially for parameters such as the TMR and the beta, regulators, where possible, should aim to derive the low and high ends such that the range could be assumed to be broadly symmetric.<sup>81</sup> If it is not possible to derive a symmetric range for the parameters, regulators should explain the reasons for the asymmetry and why the mid-point of the range is not appropriate.

### *Financeability*

122. Most regulators test the cashflow adequacy of the regulatory settlement<sup>82</sup>, a process which tends to involve the modelling of financial ratios used by credit rating agencies as an input to the rating process. While return on equity adjustments can improve certain financial ratios, it is not clear that cash flow shortfalls or the need to meet specified levels of financial ratios indicates a need to adjust the allowed return on equity.

123. Debt financial ratios are heavily influenced by assumptions on historical debt costs and capital structure. There is no clear link between these assumptions and the forward-looking cost of equity. For this reason, alternatives to uplifting the allowed return on equity (e.g. assuming equity injections) are likely to be more suitable remedies for resolving financeability issues.

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<sup>81</sup> This may be a defensible interpretation given that asymmetry may be due to sampling issues rather than a true reflection of the underlying parameter distribution.

<sup>82</sup> Ofcom is an exception to this rule.

## 7. Cost of debt

**Recommendation 9:** *Regulators should estimate an allowance for an efficient company under the notional financial structure with actual debt costs suitably benchmarked against other market evidence.*

124. The cost of debt is more easily observed than the cost of equity. Setting an allowance for the cost of debt therefore lends itself more readily to benchmarking approaches. Consistency in approach over time is an important consideration, given that regulators tend to wish to attract long-dated debt as part of an efficient financing mix, and rating agencies assign significant value to the stability and predictability of the regulatory regime. However, there is no particular reason why the cost of debt in different sectors should be similar, given differences in the time profile of debt issuance across sectors and the variable exposure to relatively higher cost issuance periods that this implies.

### Current approach

125. For the purposes of setting an allowed rate of return within a price control, most regulators allow for the recovery of costs from historically-incurred debt, as well as the expected costs of raising new debt in the subsequent price control period. This largely reflects the regulators' interpretation of their financing duty.<sup>83</sup>

126. In most sectors, the focus is market yields on long-term investment grade corporate debt, as this is the primary source of debt financing for most regulated companies. Regulators tend to draw on evidence from corporate bond indices and actual costs incurred by the companies they regulate to benchmark the cost of debt.

127. Regulators start from differing circumstances in terms of the number of companies regulated within controls, and this has shaped the regulatory approach they have adopted. Regulators of controls with multiple companies have tended to set a single benchmarked allowance for an efficient notional company, implying a range of financing out- and under-performance against this benchmark. In contrast, those regulating sectors with a single company have placed more reliance on actual debt instruments to inform allowances, subject in some cases to an efficiency review to confirm that said instruments have been efficiently reviewed.

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<sup>83</sup> Ofcom does not have an explicit financing duty in telecoms and does not model the balance sheet or cash flows of the regulated entity. However, in recent decisions, Ofcom has also tended to set an allowance for the cost of debt which gave some weight to historical debt costs.

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128. The following features are commonplace in setting the allowed return on debt in UK economic regulation:

- **Embedded & new debt:** Most UK regulators implicitly or explicitly set allowances that reflect the contribution of 'embedded' (i.e. previously-incurred) debt as well as 'new' debt to be issued in a given control period.
- **Benchmarking approaches:** Regulators with controls that include multiple companies tend to allow costs based on a notional approach involving benchmarks, rather than remunerating for actual company costs. Notional benchmarks are usually derived either from balance sheet debt data, or by taking trailing averages of debt indices.
- **Exclusions from benchmarking:** It is common for regulators to exclude some instruments from cost of embedded debt benchmarking. For instance, instruments may be excessively equity-like (e.g. preference shares) or already covered by other allowances (e.g. revolving credit facilities and the liquidity allowance). It is also commonplace to exclude the cost of interest rate swaps, as these are not essential to debt financing and can present a misleading picture of borrowing costs.<sup>84</sup>
- **Indexation:** Several regulators have moved to indexing the cost of debt, using debt indices. Indexation passes through changes in market-wide interest costs to customers, increasing the accuracy of the allowed return on debt.
- **Non-interest debt costs:** Regulators tend to set an additional allowance for costs that are not interest; for instance, issuance and liquidity costs.

### *Accounting for inflation*

129. A key area of transition relative to the previous 2023 iteration of the guidance is around how regulators account for inflation. As most regulators operate real-terms controls, nominal debt costs need to be deflated to a real basis using an inflation assumption. Prior to 2022 it was commonplace for regulators to use fixed long-term assumptions for CPI, CPIH and RPI – typically assuming 2.0% for CPI and CPIH, and adding a 'wedge' of 90-100bps to this figure to derive an RPI assumption.

130. Regulators have however become increasingly aware that high inflation can drive additional gains to equity investors when using a fixed inflation assumption (e.g. 2.0% CPIH). Firstly, where revenues are indexed to outturn inflation, there is a nominal revenue gain to companies if this exceeds the fixed inflation assumption. Secondly, while the regulatory asset base is indexed to inflation under real-terms

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<sup>84</sup> For instance so-called 'kick-the-can swaps' can be cashflow positive in the near-term but cashflow negative in the longer-term. Including these near-term cashflows as interest costs therefore presents a misleading picture of the cost of borrowing to finance investment.

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controls, the portion of it financed by fixed-rate nominal debt is not, which can drive an inflationary gain to equity. This 'inflation leverage effect' can be large – Citizens Advice calculated that it drove a revenue gain worth c.£3.9bn in energy over 2021-2024,<sup>85</sup> and calculated an equivalent figure<sup>86</sup> for water of c.£2.0bn over the same period.<sup>86</sup>

131. Regulators have addressed the changing inflation landscape in various ways:
- **Deflating with a different long-term assumption:** The PR24 CMA panel's final determination used the OBR's view that long-term CPIH was likely to be higher than long-term CPI by 0.40% to inform its CPIH assumption of 2.4%.
  - **Deflating with medium-term forecasts of inflation over the control period:** The CAA's H7 control used the OBR's medium-term forecast over the period of the control for RPI, rather than a long-term assumption to deflate debt costs to a real basis. This approach was upheld on appeal by the CMA.
  - **Setting nominal allowances for nominal fixed-rate debt:** Ofgem's RIIO-3 control sets a nominal allowance for the notional share of fixed-rate debt, and does not index the value of the regulated assets (i.e. RAV) that is financed by such debt. This approach significantly reduces the 'inflation leverage effect'.

### Cost of debt: guidance

132. Given their significant control over the timing, tenor and nature of debt issued, regulated companies should be incentivised to strike a balance between minimising interest costs and managing risk.<sup>87</sup> This objective is consistent with a notional benchmarking approach to the cost of debt allowance: all companies in such a system face a clear financial incentive to issue at lower cost than the benchmark, while it is clear that the risk of financing decisions is held by companies and their investors, because individual company costs typically do not move the benchmark appreciably. In sectors with few-to-no debt cost comparators (and relatively few debt instruments), it may be sufficient to base allowances on actual costs – particularly if it can be demonstrated that there are no concerns around inefficient issuance.
133. Regulators should aim where possible to adopt a consistent approach to remunerating debt costs over time. This is supportive of long-term debt investors, whose presence is beneficial through reducing refinancing risk, but who are disproportionately affected by changes in regulatory stance. It is also liable to

<sup>85</sup> Citizens Advice, [Debt to society](#), Feb 2025, p6

<sup>86</sup> [Citizens Advice submission to PR24 CMA appeals.pdf](#) p6

<sup>87</sup> For instance, shorter-tenor debt is usually cheaper, but may also increase refinancing risk through concentrating debt maturities in the near term.



## UKRN Cost of capital: Review of guidance - consultation

support low debt costs across the sector, as rating agencies value stability and predictability.

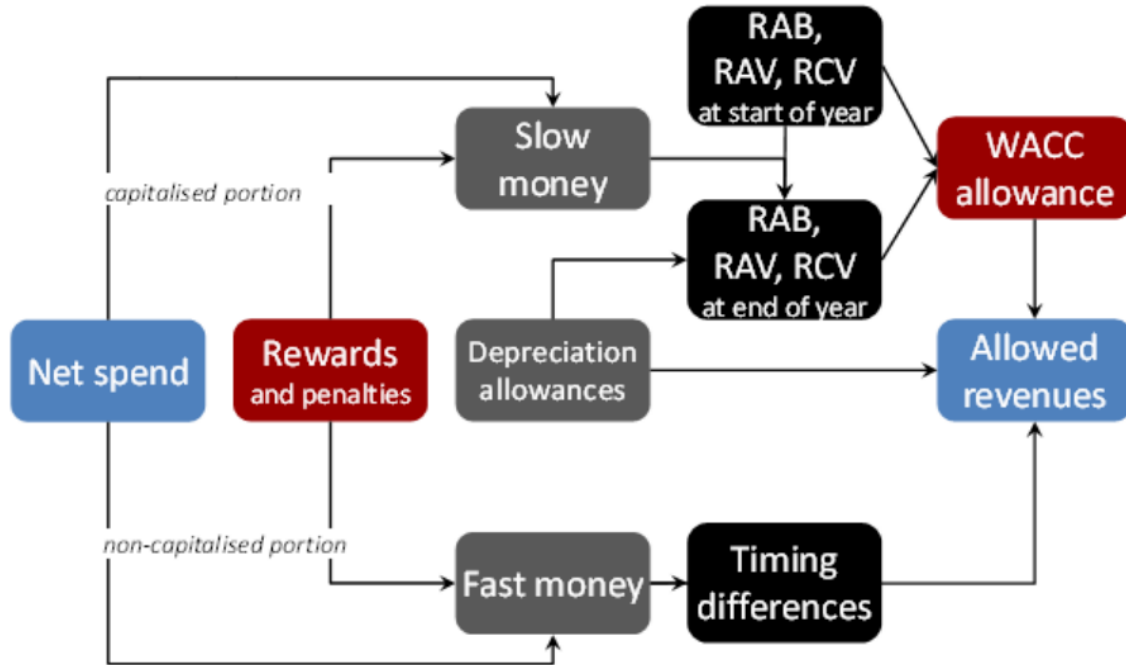
134. Regulators should set allowances for components of the cost of debt to align with characteristics of an efficiently-run notional company. For instance, the credit rating of debt indices used to set the cost of new debt should ordinarily match the target rating for such a company, or it may otherwise be appropriate to consider applying a corrective adjustment to the index yield. In making such adjustments, regulators should however clearly set out the evidence base informing their decision.
135. Specific features of the control in question, particularly the quantum of allowed capex, should be considered for consistency with components of the cost of debt allowance (for instance, the assumed share of new debt, if stated). This should improve the coherence of allowance-setting and increase the likelihood of an appropriately cost-reflective allowed return.
136. Regulators should reflect recent evidence on inflation dynamics in the setting of real-terms allowances, to limit the role of forecast risk in driving inflationary gains and losses. Given the OBR's assessment of a long-term CPIH-CPI 'wedge' of 0.4%,<sup>88</sup> it is currently difficult to retain the assumption that deflating with CPIH should remain at the 2.0% assumption used in recent determinations.
137. This guidance accordingly recommends that regulators should have regard to more recent evidence on inflation dynamics (e.g. inflation forecasts from the OBR over the term of the price control), as well as exploring measures that may avoid the need for an inflation assumption altogether (such as Ofgem's 'semi-nominal indexation').<sup>89</sup>
138. Recognising the value of predictability and stability when attracting finance that may span several control periods, regulators agree that early signalling and an evidence-based rationale will be necessary to manage the effects of a change of approach in this area.

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<sup>88</sup> Office for Budget Responsibility, '[Economic and fiscal outlook](#)', October 2024, p. 38, Box 2.3.

<sup>89</sup> We note that Ofgem retains an inflation assumption to estimate a real return on index-linked debt from the nominal cost of debt allowance. It would in principle be possible to directly derive a CPIH-real allowed return on index-linked debt through benchmarking analysis of real coupon rates, however.

## Annex: ‘Building blocks’ approach to setting price controls



The above diagram sets out how price controls work and where the allowed return on capital fits in. In simple terms, the annual allowed revenues within a ‘building blocks’ control have three main components:

- An allowance for **operating costs** (sometimes referred to as ‘fast money’);
- An allowance for **depreciation of capital expenditure** (sometimes referred to as ‘slow money’), and
- An allowance for **profit**, calculated as the average value of the asset base (RAB, RAV or RCV, depending on the terminology used by each sector) multiplied by the WACC.

In some price controls there could be other components – for example, financial rewards or penalties associated with different incentive mechanisms, or an allowance for tax.