Response to the UKRN cost of capital consultation

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Prepared for Anglian Water Services Ltd, Heathrow Airport Holdings Ltd, and Scottish Hydro Electric Transmission plc

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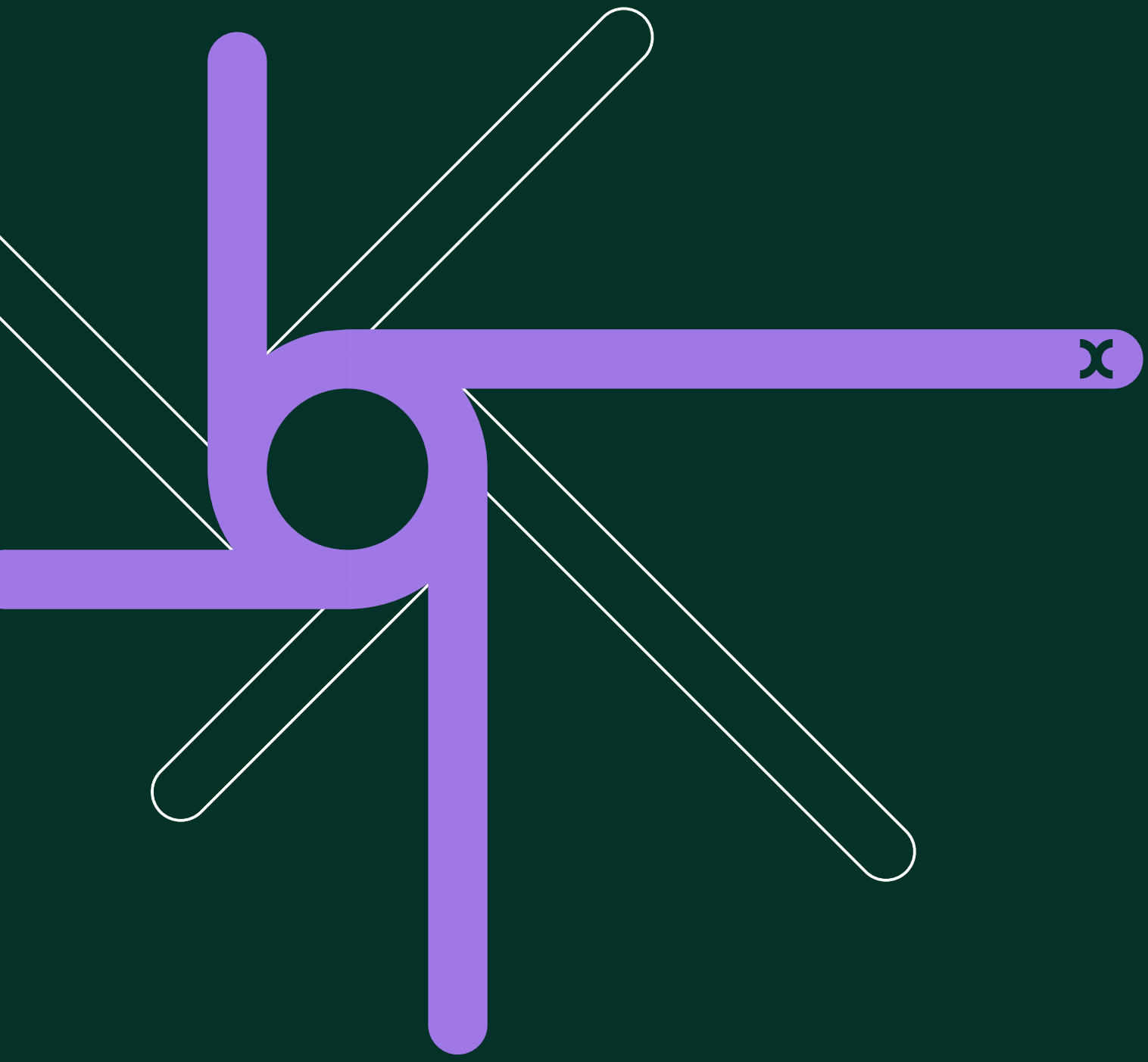

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Executive summary

The cost of capital—and particularly the cost of equity (CoE)—is complex to measure. A methodology for estimating the cost of capital is therefore necessary for determining the regulated level of prices or allowed revenues. The UK Regulators Network (UKRN) seeks to promote consistency across regulators and over time through issuing guidance on the cost of capital estimation methodology.

More precisely, the guidance aims at consistency in determining the allowed return on regulatory capital. This concept is related to but distinct from the cost of capital, as it reflects policy decisions overlaid on a technical assessment of the cost of capital.

In forming such regulatory policy, the following challenges are central, and form the basis of the UKRN consultation, and the structure for this report.

- Challenge #1: How sensitive should the allowed return on equity be to market conditions?
- Challenge #2: Estimating the return required by the notional company
- Challenge #3: Setting a robust point estimate considering welfare impacts of underinvestment

To contextualise our work on these challenges, we first address how prescriptive the UKRN cost of capital guidance should be, highlighting that consistency is not an end in itself. **A degree of flexibility across sectors is necessary** if regulators are to determine an allowed return that appropriately discharges their duties.

We also encourage an open approach to evidence in order to ensure that the determination of the allowed return is robust. Specifically, **UKRN guidance should not foreclose on regulators making adjustments where evidence supports this** (e.g. risk-free rate, RfR), even if this evidence is currently modest or uncertain.

This principle is equally vital when applying cross-checks to selecting a point estimate. Because estimation under the capital asset pricing model (CAPM) is uncertain, it can produce a wide range of plausible estimates. While there is a diverse range of available cross-checks, debt-based approaches can offer more substantive informational value by leveraging empirical debt market data, including evidence from

unlisted companies. The importance of this approach was demonstrated by the CMA in its PR24 redetermination, where cross-checking the unlevered CoE against the cost of new debt (CoND) established the need to select a point estimate above the mid-point of the CAPM.[1] **We thus recommend that UKRN guidance formalise the integration of debt-based cross-checks when selecting a point estimate**.

In addition to these, we review the evidence on the long-term inflation assumption used to convert nominal input data into CPIH-real values. We find that, contrary to proposed UKRN guidance, **there is no robust basis for ruling out a particular value or range for the CPIH inflation assumption**. We recommend that regulators assess inflation evidence carefully and without prejudice at each price control.

Turning to the three central challenges, we review the fundamental arguments and consider the available evidence, before putting forward **recommendations that we consider necessary, proportionate, and implementable across the aviation, energy, and water sectors**.

Challenge #1: How sensitive should the allowed return on equity be to market conditions?

Measuring how the CoE has changed after an increase or decrease in interest rates presents the first challenge. This is followed by the policy question—should the allowed return then change by the same degree? An allowed return that moves continuously with market conditions risks impinging on financeability. Conversely, a return that is wholly invariant to market conditions risks rendering the regime uninvestable over time.

The key CAPM components describing this balance of stability versus responsiveness are the total market return (TMR) and the equity risk premium (ERP).

We recommend a TMR estimate that is relatively stable through time, yet with sufficient policy flexibility to respond to significant changes in market conditions. This can be achieved with the following regulatory policies.

- A weighted average of the Stable TMR and Stable ERP approaches (Option 3 in this report);

[1] CMA (2026), 'Final Determinations Volume 4: Allowed return - chapter 7', 10 March, para. 7.541, 7.576.

- Keeping TMR constant unless the Stable ERP-implied TMR moves outside a deadband centred on the Stable TMR (Option 4 in this report); or
- An 'embedded cost of equity', where distinct asset tranches are remunerated at separate allowed returns (Option 5 in this report).

Crucially, regulatory policy which weights between the Stable TMR and Stable ERP approaches in order to balance stability and responsiveness implicitly assumes a negative, stable and symmetrical relationship between the ERP and RfR. This is clearly a simplified and imperfect model of how the TMR varies over time. Therefore, **we recommend that while regulators should have discretion to vary the weights over time and across sectors, they be explicit about the weights they are applying and why they have chosen them.**

We also recommend that the relationship between the RfR, TMR, and ERP be investigated in greater detail, with regulators consulting on how specific policy choices (e.g. calibration of the weights, size of deadbands) respond to this.

Challenge #2: Estimating the return required by the notional company

Foundational CAPM literature shows that the **cost of capital and beta is shaped not only by systematic market risks but also by expected company value, which itself is affected by the full range of risks a company faces.** This implies that the beta of a listed company that is expected to out-perform or under-perform the assumptions that regulators make about the efficiently operated firm will be a biased estimator of the notional company beta.

Evidence provided in this report shows that a listed company with a market value that is higher than the value of the regulated asset base (RAB) would have a materially lower asset beta. This results in significant bias to the estimate of the cost of capital for the notional company.

Options exist for correcting this bias, including: (i) selecting a beta point estimate above or below the mid-point of the estimated range, (ii) applying differential weights to individual comparators within the sample, or (iii) quantifying the adjustment as illustrated in this report.

We recommend that regulators investigate this issue thoroughly and consult on the possible solutions.

Challenge #3: Setting a robust point estimate considering welfare impacts of underinvestment

The draft UKRN guidance recommends using the mid-point of the estimated CAPM range as the central estimate for the CoE—which is unknown—and that regulators should only deviate from the mid-point if there are strong reasons. **While the guidance mentions the welfare impacts of underinvestment, it does not contain the crucial finding that consumer welfare is maximised by adopting a point estimate above the mid-point.** Indeed, the guidance gives the appearance of seeking to dismiss this important finding.

Although this finding is not new, it has become more important due to the following.

1 The increase in the scale of investment required across sectors is significant and will be sustained for many years.
2 The impact on customers of underinvesting has increased as infrastructure needs to be resilient to a heightened set of pressures, for example from climate change and security threats.

We recommend recognising in the guidance that in most if not all circumstances, **setting the allowed return at the mid-point of the estimated cost of capital range will result in lower consumer welfare than setting the allowed return above the mid-point.** A rigorous consideration of the evidence is needed to determine how far above the mid-point of the range the allowed return should be set.

1 Introduction and context

On 24 June 2026, the UK Regulators Network (UKRN) published its revised guidance on the methodology for setting the allowed regulatory return on capital, with an eight-week consultation period.

Oxera has been jointly commissioned by Anglian Water Services Ltd, Heathrow Airport Holdings Ltd, and Scottish Hydro Electric Transmission plc to respond to the UKRN consultation. Our considerations and recommendations thus cover the water, aviation, and energy sectors, and are intended to be relevant across these jurisdictions.

The challenges confronting regulators across UK regulated sectors in cost of capital estimation are not only technical, but also policy questions. In practice, setting the regulatory allowed return on capital is a distinct exercise from estimating the forward-looking cost of capital. This is because the allowed return is a regulatory determination that must simultaneously satisfy a broader set of competing constraints arising from the regulator's statutory objectives.

Regulators thus preside over a constrained optimisation effort, which is compounded by the limitations inherent in the capital asset pricing model (CAPM). There are **three underlying challenges that are central to addressing the UKRN consultation** questions, in order to ensure a more robust approach to setting the allowed return on capital. We structure our report according to these challenges, which are summarised below.

1 How sensitive should the allowed return on equity be to market conditions?
2 Estimating the return required by the notional company
3 Setting a robust point estimate considering welfare impacts of underinvestment

In addition to these, we also examine the evidence on the inflation assumption that should be used when converting the cost of debt from nominal to CPIH-real values.

Before turning to these matters, we address two overarching questions.

- How prescriptive should UKRN guidance be?
- How should regulators deal with evidence?

1.1 How prescriptive should UKRN guidance be?

Consistency in the treatment of common CAPM parameters increases the predictability of the regime, which may support investor confidence—this is the premise for greater methodological alignment across UK regulated sectors.

However, **regulatory alignment for the sake of consistency should not mean an inability to respond to sector-specific challenges** where this is warranted by evidence. As underlying macroeconomic change takes place and unprecedented investment plans are made, sector-specific regulatory discretion in setting allowed returns is increasingly important. For example, regulators may agree that a blended total market return (TMR) and equity risk premium (ERP) approach (Option 3 in this report, see Section 2.4.3) is a suitable policy device across sectors; however, guidance should not then prescribe the precise weights that all sectors should use.

Crucially, **it is not clear that greater consistency or precision in regulatory guidance ensures the accuracy of the estimate of the cost of capital**. Indeed, overly restrictive guidance could reduce the accuracy of CAPM estimates, given the variance in circumstances across sectors. Where common parameters like the risk-free rate (RfR) and TMR are uniform, sector-specific estimation accuracy becomes entirely dependent on precise beta measurements and the use of cross-checks. As both of these also carry inherent uncertainty, standardising the common parameters may simply concentrate the risk of systematic error.

1.2 How should regulators deal with evidence?

Despite the inherent limitations of the CAPM arising from parameter uncertainty and measurement error, it constitutes an important part of the accepted regulatory framework. However, these limitations underline the necessity of seeking additional sources of evidence to cross-check and inform the point estimate. Regulators should therefore adopt an open approach to gathering and considering evidence on the cost of capital.

As observing the 'true' cost of equity is inherently more complex than observing the cost of debt, **a narrow or mechanistic approach to evidence cannot reduce the uncertainty arising from CAPM estimation.** This does not mean that regulators should accept all available evidence without scrutiny. Rather, it is about recognising that **uncertainty around a piece of evidence is not, in itself, grounds for disregarding it,** particularly where that evidence consistently points in the same direction as other indicators.

While the treatment of evidence should be proportionate, where a source of evidence is imperfect, or its quantitative impact is currently modest or uncertain, **the appropriate response is to assign it a considered weight rather than to exclude it.**

This approach to evidence should apply equally to both CAPM parameter estimation and point estimate selection, with particular importance to the following subsections.

1.2.1 RfR

UKRN guidance should not dismiss adjustments to index-linked gilts (ILG) yields or alternative RfR proxies. As recognised by the Competition and Markets Authority (CMA) in the PR19 appeals, ILGs are 'unlikely to provide a perfect (or wholly sufficient) proxy for the RfR in isolation'.[2]

Crucially, a decrease in the relative size of the convenience yield in an environment of quantitative tightening is not sufficient evidence to ignore its existence. As such, the guidance should retain the option for regulators to make adjustments to the RfR to control for the convenience yield where evidence supports this, rather than recommending against any adjustment as a matter of principle. Embedding the sole use of unadjusted ILG yields as a point of cross-sector alignment forecloses legitimate and evidence-based regulatory decisions on a material parameter.

1.2.2 Debt-based cross-checks

Given that the CAPM and the diverse range of available cross-checks produces a wide variance in plausible estimates, debt-based approaches to estimating the cost of equity can be particularly informative. This is because they provide a perspective that complements the information embedded in the CAPM framework. Debt-based cross-checks incorporate evidence that is directly observable from market prices and available for regulated companies that are not listed on equity markets. This reduces the challenges faced in defining the comparator sample within the CAPM estimation.

For these reasons, regulators including the CMA and the UK Civil Aviation Authority (CAA) have considered debt-based evidence

[2] Competition and Markets Authority (2021), PR19 Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations: Final report, 17 March, para. 9.108.

alongside CAPM-based cost of equity estimates when assessing the reasonableness of allowed returns.[3]

A key challenge in applying debt-based cross-checks however is the calibration of what the spread should be between equity and debt returns. We propose a progressive approach to this calibration in the following subsections.

Unlevered cost of equity v cost of new debt

The unlevered cost of equity is the return required by equity investors on the company's assets before capital structure effects. As equity holders are a residual claimant on cash flows, the cost of new debt (CoND) forms a lower bound for the unlevered cost of equity.

This was acknowledged by the CMA. While it did not identify a specific threshold, in its PR24 redeterminations it stated that its CAPM-implied mid-point cost of equity implied a spread (21bps) to the CoND that may be 'too narrow' and cited this as a reason to aim up on the cost of equity.[4] The CMA precedent implies a spread of 36bps after the aim up.[5]

Updating the UKRN guidance to formalise this cross-check to CAPM estimation would reduce the risk that decisions on the allowed equity return are set too low relative to the CoND. The guidance would recognise that while the 'ideal' spread between the unlevered cost of equity and the CoND is not known, it should be positive and economically meaningful.

Asset risk premium–debt risk premium

An extension to the unlevered cost of equity cross-check is to compare the risk premia components of the unlevered cost of equity and the CoND, i.e. the asset risk premium (ARP) and the debt risk premium (DRP).

[3] The CAA, in Heathrow's H8 Initial Proposal, applied the asset risk premium to debt risk premium spread as a cross-check to the CAPM-based cost of equity. The CMA, in its PR24 Final Determinations, considered a number a debt-based cross checks and put weight on the unlevered cost of equity to the cost of new debt cross-check.
[4] Competition and Markets Authority (2026), 'Final Determinations Volume 4: Allowed return - chapter 7', 10 March, para. 7.798.
[5] Based on an implied unlevered cost of equity of 4.14%, this is based on calculation of an asset beta implied by the cost of equity point estimate of 5.70% while keeping the mid-point RfR and TMR estimates constant.

Further details of this approach are in, among others, our report for the Energy Networks Association (ENA).[6] While there are several advantages to using the ARP–DRP framework as a cross-check, a key strength is that unlike the unlevered cost of equity cross-check, **the ARP–DRP framework focuses on the compensation required for bearing risk, and thus does not need an explicit inflation assumption.** This feature is particularly valuable during periods of rapidly changing interest rates and inflation uncertainty.

[6] Oxera (2024), 'Evaluation of the ARP–DRP framework', prepared for Energy Network Association's electricity distribution network operator and transmission owner members, 8 November, accessed: https://www.spenergynetworks.co.uk/userfiles/file/Oxera-Evaluation-of-the-ARP-DRP-Framework.pdf. See also Oxera (2020), 'Asset risk premium relative debt risk premium', 4 September, accessed: https://www.oxera.com/insights/reports/asset-risk-premium-relative-to-debt-risk-premium/.

2 Challenge #1: How sensitive should the allowed return on equity be to market conditions?

A central question facing regulatory policy is the degree to which the allowed return on capital should track prevailing macroeconomic conditions.

The two extreme positions of these, i.e. static versus dynamic, are individually problematic. An allowed return that moves continuously with market conditions risks impinging on credit metrics and financeability, undermining the ability to raise debt and equity at an efficient cost. Conversely, a return that is invariant to market conditions risks rendering the regime uninvestable over time, as the allowed return may be below the required return on equity when rates are high. When rates are low, the allowed return may be above the required return on equity, resulting in prices that are unnecessarily high.[7] For this practical reason, the allowed return, and therefore the TMR estimate, cannot be considered independently from a full assessment of the impact on consumers, and financeability and investability.

To inform an answer to this challenge, we explore relevant arguments in the following subsections, including a discussion of practical options.

2.1 Balancing stability and responsiveness

The need to balance stability and responsiveness of the allowed return to market environments arises from the mismatch between the length of regulatory periods—typically five years—and the investment horizon of infrastructure investors, which commonly extends across decades.

This mismatch results in regulatory risk: where investors cannot rely on a fixed return over the duration of their investment, they must instead form expectations about how the allowed return will evolve across successive regulatory reviews. Where those expectations are uncertain or liable to disruption, the cost of capital is likely to be higher than it would otherwise need to be. However, this does not mean that flexibility in regulatory judgement should be so restricted as to limit the ability to respond to key sectoral challenges, nor that it should be so flexible as

[7] The point at which interest rates should be referred to as 'low' or 'high' is not defined. Care should be taken to avoid making an implicit assumption that equates 'low' with 'below the long-term average' and 'high' with 'above the long-term average', unless there is good justification.

to amount to regulatory inconsistency (see Section 1.1). Rather, **it is about the need for regulators to establish and communicate a deliberate and systematic view of how the sector would respond to market environments**.

Central to developing this view is the broader characteristic of infrastructure investors, who appear willing to bear some risk of changes in market discount rates but are considerably more averse to cash flow variability. This suggests that **regulatory policy tending towards stability can moderate the impacts of the mismatch**.

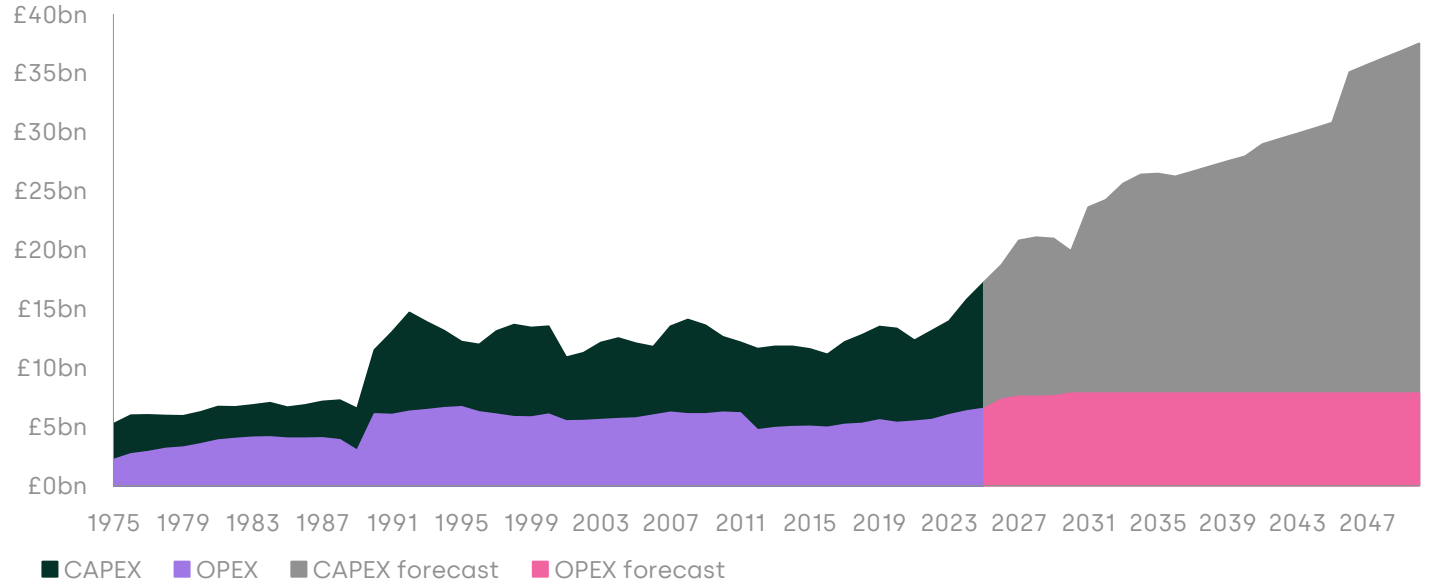
Empirical evidence supports this view, holding that provided the expected return exceeds the prevailing required return on capital at the point the investment decision is made, infrastructure investors have a clear preference for return stability over time rather than responsiveness to market movements. In turn, a stable return offered on an infrastructure asset is likely to minimise the cost of capital throughout the asset lifecycle, delivering the investment at the lowest cost to consumers.

Experience from single-asset regimes, such as Sizewell C, Thames Tideway Tunnel, and offshore transmission owners (OFTOs), illustrates these dynamics directly: in those contexts, investors have consistently favoured a fixed allowed return over a long period, typically 15 to 25 years, to facilitate a higher certainty of cash flows.

However, in multi-asset regulated regimes, or where investment is not made at a single defined point, the mismatch is more complex. This is because **where investment decisions are made continuously or on a rolling basis, a single fixed return cannot serve all cohorts of investors over time equally well**. This observation is instructive given the investment outlooks for water (2025–2050, including historical data from 1975), aviation (2025–2050, including historical data from 2020), and energy transmission (2025–2030, including historical data from 1979), shown in Figure 2.1, Figure 2.2, and Figure 2.3.[8]

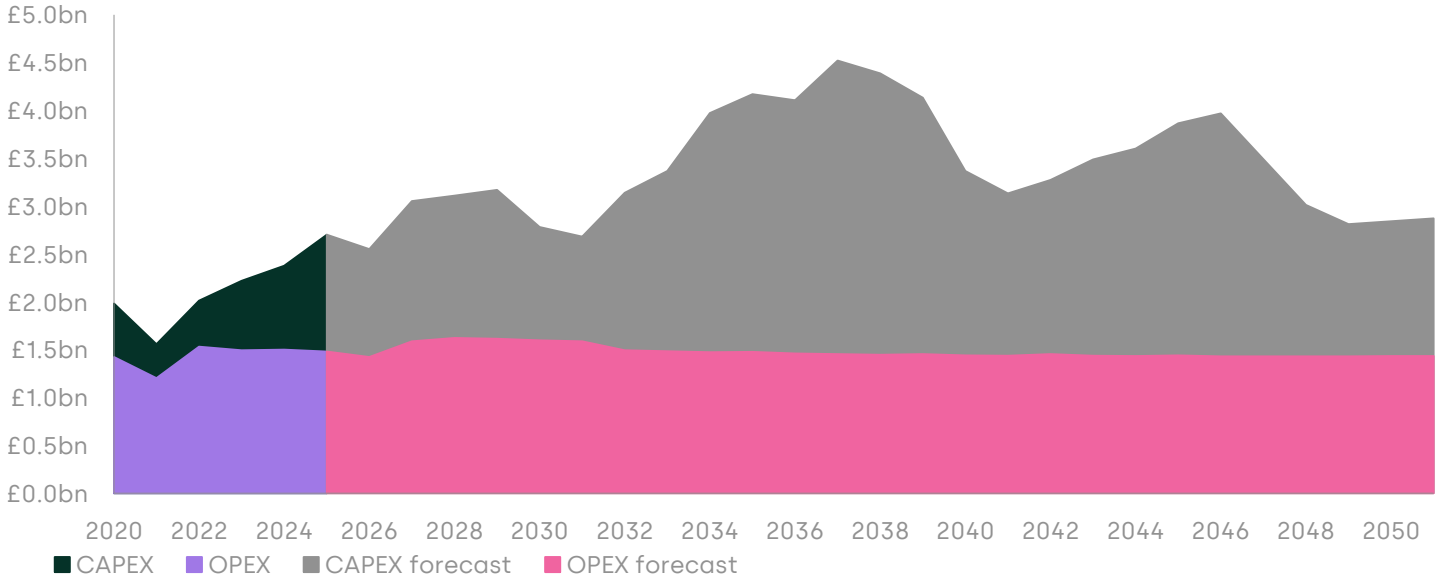
[8] Note that each sector shown in Figure 2.1, **Error! Reference source not found.**, and Figure 2.3 has a different starting point: 1975 for water and sewerage, 2020 for aviation and 1979 for electricity transmission.

Figure 2.1 Historical and forecasted OPEX and CAPEX for water and sewerage companies (2024–25, CPIH-real terms)



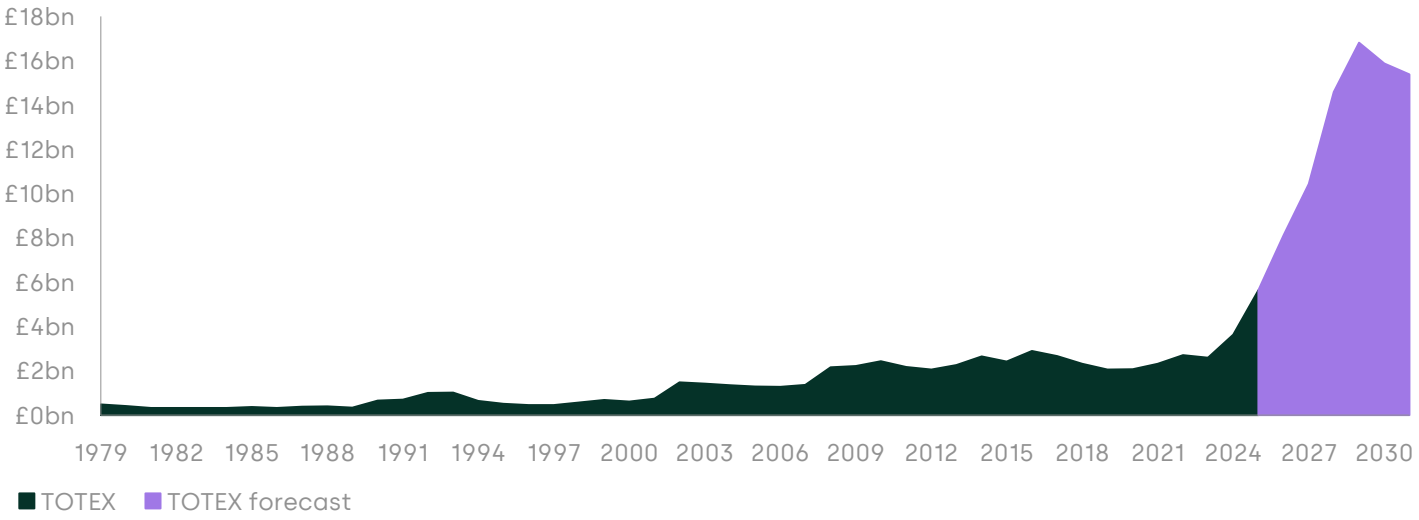
Note: Expenditure forecast based on PR24 Final Determinations for AMP8 and LTDS forecast enhancement CAPEX for the following periods. For AMP9 onwards maintenance CAPEX is assumed equal to the RCV run-off rate. OPEX forecast is based on the Price Control Financial Models up to 2030, and is then assumed to remain constant.
Source: Oxera analysis.

Figure 2.2 Historical and forecasted OPEX and CAPEX for HAL (2024–25, CPIH-real terms)



Note: Figures shown exclude the costs relating to the proposed third runway.
Source: Oxera analysis based on (i) the CAA's H7 financial model for the years 2020–26, and (ii) the CAA's H8 financial model for the years 2027–51.

Figure 2.3 Historical and forecasted TOTEX for the electricity transmission sector (2024–25, CPIH-real terms)



Source: Oxera analysis based on (i) Ofgem Annual Iteration Process for Transmission publication and TOs' business plans for the years 1979–2021, and (ii) RIIO-ET3 financial model for the years 2022–31.

It follows that the appropriate balance between stability and responsiveness of the regulatory allowed return cannot be fixed. At times of significant investment, the case for greater return responsiveness strengthens when rates are higher—a stable but inadequate return will deter the new capital injections that the investment programme requires. Conversely, if investment is relatively high when rates are lower, the allowed return should respond to the lower rate environment, albeit still securing financeability.

Because the large majority of UK regulated infrastructure operates across multiple overlapping investment cycles, **regulators must balance the investor preference for stability against the need to ensure that allowed return remains adequate at each successive point of investment** to ensure there is sufficiency of capital supply.

2.2 Evidence from international precedents

To assist UK regulators make judgements on the appropriate balance between stability and responsiveness to market conditions, we review relevant evidence on approaches to the TMR in eight other regulatory jurisdictions: Australia, Belgium, France, Germany, Italy, the Netherlands, New Zealand, and Spain.

In general, our research suggests that **there was broad consistency internationally towards a smoothing of the TMR when rates fell, and**

updating of the TMR higher when rates rose, although this was achieved in different ways. Summary findings are explored in the following subsections.

2.2.1 Declining rates in the 2008–2022 period

During this period of falling rates, a consistent pattern emerged across the jurisdictions examined: regulators systematically set the RfR above prevailing spot sovereign yields, primarily through using trailing averages and, in some cases, explicit floors or direct adjustments. In effect, **regulators insulated the regulatory allowed return from the full impact of depressed market rates, producing an implied TMR that remained significantly above what a more responsive approach (e.g. Stable ERP) would have generated**. This was broadly reasoned as being due to financeability or investability concerns.

France's CRE acknowledged that its ten-year trailing average methodology, which experienced little change across three tariff periods, 'allowed it to maintain the attractiveness of energy infrastructure in France, while taking account of the downward trend in rates over several years'.[9] Spain and Germany relied on similar trailing averages of six and ten years respectively, each producing an RfR above contemporaneous spot yields. Further, the CNMC in Spain applied an explicit correction of 80bps for quantitative easing (QE) to its observed sovereign yield average to remove the distortionary effect of ECB asset purchases on the RfR, thereby raising its implied TMR.[10] Elsewhere, the Netherland's ACM was more direct, applying an explicit floor of 0.5% when its three-year average of Dutch and German bond yields approached zero or negative territory.[11]

ARERA's methodology changes during this period are also notable examples, from a Stable ERP to a Stable TMR methodology in 2015 to keep the total real market rate of return stable throughout the regulatory period.[12]

The evidence shows that **regulators consistently recognised that the allowed return needed to be more stable than responsive to sharply**

[9] Translated from: ' Cette méthode, qui avait très peu évolué depuis trois périodes tarifaires, a permis de maintenir l'attractivité des infrastructures d'énergie en France, tout en prenant en compte la tendance d'évolution des taux à la baisse pendant plusieurs années.' See Commission de Régulation de l'Energie (2025), 'Délibération de la Commission de régulation de l'énergie du 13 mars 2025 portant décision sur le tarif d'utilisation des réseaux publics de distribution d'électricité (TURPE 7 HTA-BT)', p. 93.
[10] Comisión Nacional de los Mercados y la Competencia (2025), 'CIR/DE/002/24', section 4.2.
[11] Autoriteit Consument en Markt (2026), 'Methodebesluit bijlage 3A WACC', section 2.1.5.
[12] Autorità di Regolazione per Energia Reti e Ambiente, Decision 583/2015/R/COM (583-15.pdf), pp. 13 and 16.

falling interest rates at the time—notwithstanding that there was no single common smoothing methodology applied to either the RfR or TMR.

2.2.2 Rising rates in the post-2022 period

Conversely, the period after 2022 saw a sharp increase in interest rates. Across the jurisdictions examined, this mostly flowed into allowed returns via the RfR, rather than through any revision to the ERP or TMR.

Notably, for regulators that estimate the ERP directly and hold it fixed, an upward adjustment to the RfR is equivalent to an increase in the implied TMR, all else equal. This was the case for France's CRE and Spain's CNMC, where significant structural adjustments were made to the RfR, effectively increasing the implied TMR. The CRE replaced its ten-year trailing average RfR with a blended long-term/short-term rate weighted by each entity's asset mix, acknowledging that its prior approach no longer captured prevailing financing conditions.[13] The CNMC increased its QE correction to its observed sovereign yield average from 80bps to 183bps, thereby further raising its implied TMR.[14]

Germany's Bundesnetzagentur also significantly changed its approach to the RfR post-2022. Under its previous approach, the RfR was based on a ten-year average—however, its revised approach in the current regulatory period applies an RfR based on the 2024 annual average for assets established in 2024, which will then apply for the remainder of the regulatory period.

The ACM (Netherlands), VREG (Belgium), NZCC (New Zealand) and AER (Australia) relied on existing frameworks to reflect higher rates. As these regulators estimate the ERP directly, higher interest rates flowed into the implied TMR via the RfR, without requiring mechanical changes.

This evidence shows that while regulators did not adopt a common methodology, **they recognised that rising interest rates in the post-2022 period required the allowed return to be more responsive than stable**.

2.3 The relationship between the RfR, ERP, and TMR in the UK

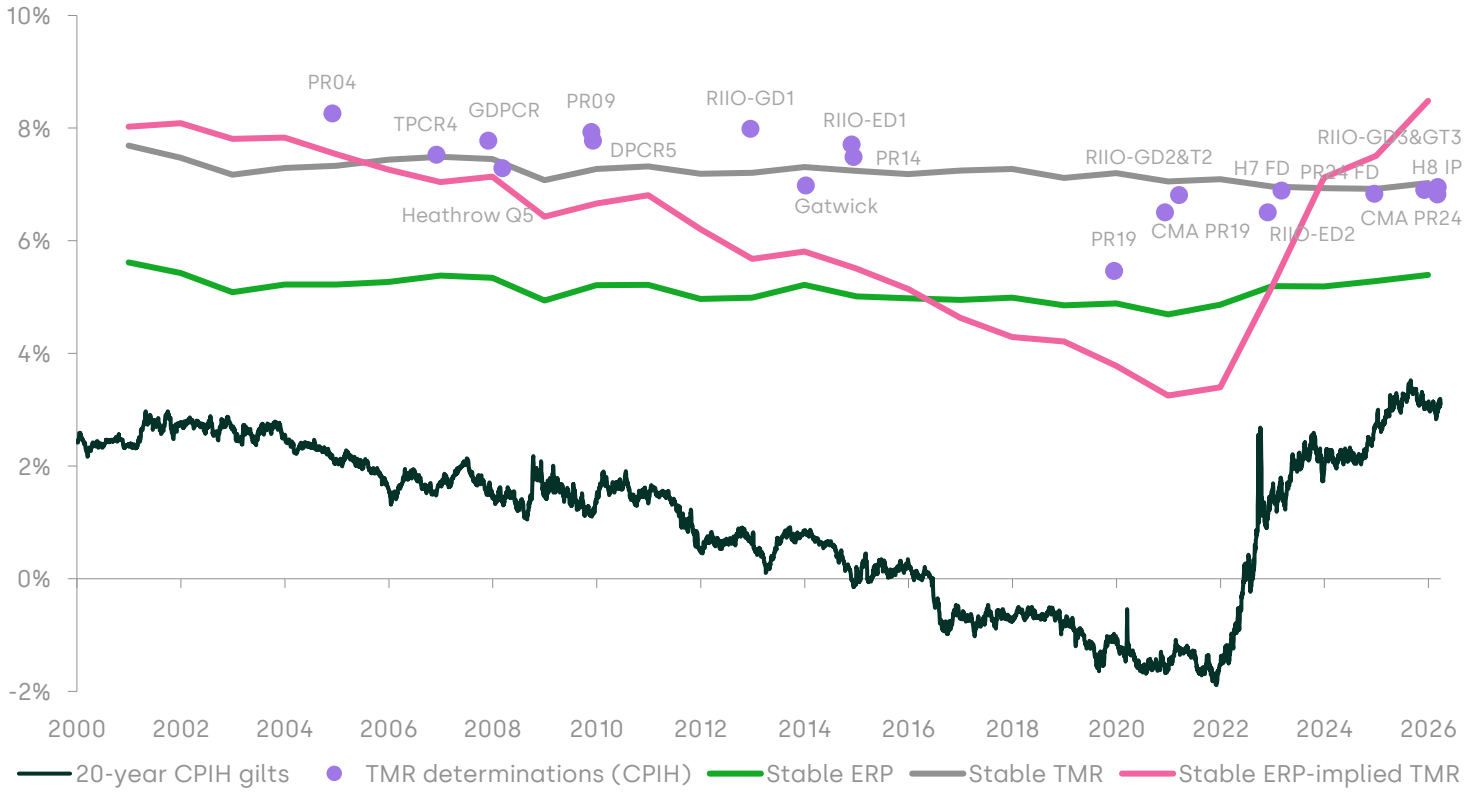
The RfR, ERP, and TMR are intrinsically linked. As the RfR and ERP sum to the TMR, the behaviour of any one of these variables over time is directly shaped by the behaviour of the other two. However, as these

[13] Commission de Régulation de l'Energie (2025), 'Délibération de la Commission de régulation de l'énergie du 13 mars 2025 portant décision sur le tarif d'utilisation des réseaux publics de distribution d'électricité (TURPE 7 HTA-BT)', p. 93.
[14] Comisión Nacional de los Mercados y la Competencia (2025), 'CIR/DE/002/24', table 24.

parameters are uncertain, their estimation is a function of methodology. For example, when the RfR increases, a 'Stable TMR' assumption implies a lower ERP, while a 'Stable ERP' assumption implies a rising TMR. Understanding how these variables have moved together historically is therefore essential for evaluating the relative merits of different TMR estimation approaches and the policy choices they imply.

Figure 2.4 illustrates the historical evolution of estimates of the RfR, ERP and TMR in the UK, which provides important context for evaluating the merits of different TMR estimation approaches.

Figure 2.4 The relationship between the RfR, ERP, and TMR in the UK



Source: Oxera analysis based on DMS and Bank of England data.

Like Figure 4 in the UKRN consultation, we derive the Stable TMR series as an extending arithmetic average of ex post one-year holding periods of UK equity returns from the DMS dataset, while the Stable ERP series is derived as an extending arithmetic average of one-year holding periods of the in-year difference between historical UK equity returns and government bond returns from the DMS dataset.

We derive the 20-year CPIH gilt yield series from 20-year RPI-linked gilt yields, adjusted by an RPI–CPIH wedge to convert to a CPIH-real basis. [15] The Stable ERP-implied TMR series is derived additively as the sum of the Stable ERP estimate and the 20-year CPIH gilt yields. Our estimation of the Stable ERP-implied TMR aims to replicate the CMA's approach in its PR24 Final Determinations: our methodology is identical in all material respects, with the exception of estimating the RfR.[16]

In periods of higher interest rates, such as those observed in the early 2000s and more recently since 2022, the Stable ERP approach implies a higher TMR estimate than the Stable TMR approach, reflecting the direct passthrough of RfR movements. Conversely, in the prolonged low-interest-rate environment of the 2010s, the Stable ERP approach implied a lower TMR. This cyclical behaviour illustrates the responsiveness of the Stable ERP approach to macroeconomic conditions, based on the assumption that falling rates do not reflect an increase in macroeconomic risk, i.e. there was no negative correlation between the RfR and TMR.

This points to an important conclusion: **despite the Stable TMR approach being the stated primary methodology across UK economic regulation, the TMR allowance has not in practice been stable nor static over time**. Shifting estimator weights and reliance on ex-ante approaches have meant that the allowed TMR has moved materially across control periods. This has been compounded by the transition to expressing TMR in CPIH-real rather than RPI-real terms, which has obscured the reduction in the TMR once inflation is accounted for.

Regulators have therefore been making implicit policy choices that introduce variability into the Stable TMR allowance. The challenge is to ensure that such movement is governed by an explicit and principled framework, grounded in clear evidential criteria. Making that framework transparent is, in our view, the most important contribution UKRN guidance could make in this area. We build on this in the following subsection.

[15] To calculate the CPIH gilt yield, we assume the RPI-CPIH wedge to be 0.5% pre-2010, 0.7% across 2010–2015, and 1% from 2015. In contrast, the UKRN assumed the RPI-CPIH wedge to be 0.5% pre-2010 and 1.0% across 2010–2020, and figures between 2020 and 2025 interpolate between 1.0% and the CMA's 0.21% wedge for its FD. See UK Regulators Network (2026), 'Cost of capital – review of guidance on methodology for setting cost of capital consultation', footnote 63.
[16] The CMA used a point-in-time estimate of RfR (using a one-month average of 20-year RPI-linked gilt yields and a 0.21% wedge), while we use a calendar-year average of 20-year gilt yields and apply an RPI–CPIH wedge as described in the previous footnote.

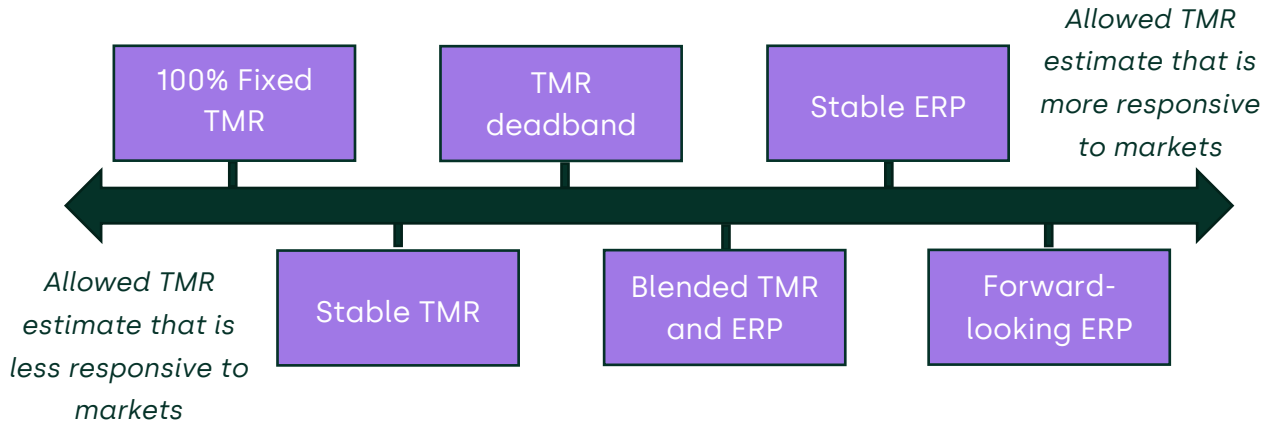
2.4 Proposed TMR estimation methodology

The estimation of the TMR is the central issue of debate in the UKRN consultation, and is the key parameter impacting the responsiveness of the allowed return estimation to market conditions. While the TMR methodology is informed by finance theory, **the key question is not only about determining, with the greatest precision, the point-in-time 'true' TMR, but how responsive the regulatory allowed return should be to the macroeconomic environment**.

Different methodologies imply materially different answers to this question, and the choice between them has significant consequences for the stability and adequacy of allowed returns across the investment cycle. This is separate to the question of whether the TMR or the ERP is more stable, which is itself an unresolved question in academic evidence.[17] It is also separate to the question of whether symmetrical deviations of the RfR from its long-term average are mirrored by symmetrical deviations of the TMR from its long-term average—the relationship between changes in the RfR and TMR is not necessarily linear.

Drawing from the arguments and considerations detailed in Sections 2.1—2.3, we conclude that **the optimal TMR policy must balance two objectives: providing sufficient stability to support investor confidence and long-term financing decisions, while ensuring that the overall level of allowed returns does not diverge too far from market-required returns**. This balance is particularly important at times of heightened investment need, when the consequences of an inadequate allowed return are most acute and the cost of deterring new equity most significant.

The graphic below summarises the spectrum of practicable methodology options we consider further in this section.



[17] Empirical evidence suggests that the relationship between the RfR, ERP, and TMR alters in tail events where interest rates change significantly, triggering flights to quality.

2.4.1 Option 1: Stable TMR

The Stable TMR approach proceeds from the premise that the total return expected by investors from holding a diversified portfolio of equities is broadly stable over time, irrespective of prevailing interest rate conditions. Under this approach, the ERP is derived residually as the difference between a long-run estimate of TMR and a current estimate of the RfR. As the RfR moves, the implied ERP is implicitly assumed to adjust to compensate, leaving the overall TMR, and therefore the cost of equity, broadly unchanged through rate cycles.

This approach relies on calculating the arithmetic average of long-run historical equity return data, most commonly the DMS dataset, which provides UK equity returns from 1900 to the present.

The Stable TMR approach has been the dominant methodology across UK economic regulation, valued for its stability and predictability. By anchoring the cost of equity to a long-run TMR estimate, it produces an allowed return that is largely insulated from short-term interest rate volatility.[18]

The drawback to this is that the Stable TMR approach is slow to respond to new annual market data, the consequences of which have become more apparent in recent regulatory determinations amid higher interest rates. Given the need across multiple sectors for significant capital investment, **a static approach to the TMR can diminish the attractiveness of a sector to new investors**, who are able to attain similar investments with returns that are more aligned to market returns.

Putting the Stable TMR methodology into practice has also been problematic, as it has been taken to include both the historical ex ante and ex post approaches. Some of the differences between TMR estimates from these two families of approaches were due to inconsistencies, such as how to calculate the adjustment from a geometric average to an arithmetic average. In our view, **where the Stable TMR methodology is applied, only the historical ex post TMR should be given weight**, as it is based on arithmetic averaging of annual returns without requiring subjective adjustments.

2.4.2 Option 2: ERP-based approaches

ERP-based approaches derive the TMR additively as the sum of an estimate of the ERP and a current estimate of the RfR. As the RfR moves,

[18] The DMS dataset covers a long period, which reduces the standard error of the estimate of long-term average returns.

the implied TMR moves with it, meaning the cost of equity is more sensitive to changes in the interest rate environment than under the Stable TMR approach.

A range of methodologies exists for estimating the ERP, from historical ex ante and ex post long-run approaches to forward-looking approaches.

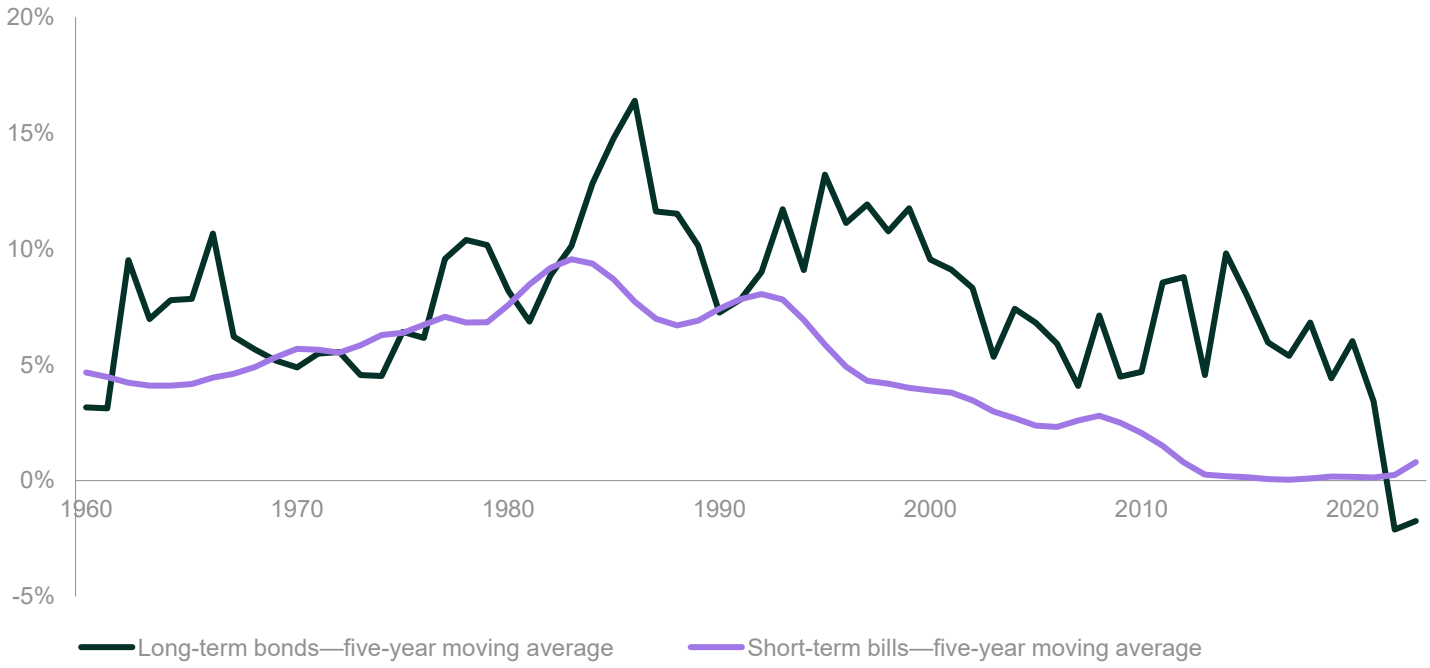
At one end of the spectrum, the Stable ERP approach derives the ERP as a long-run average of the in-year difference between realised equity returns and the return on government bonds, using the DMS dataset. This is the approach broadly adopted by the PR24 CMA panel in its 'high' estimate of the cost of equity, although we note that appropriate estimation of historical ERP should account for inflation using the Fisher equation rather than arithmetic difference.[19,20] Using this approach, the inflation elements of TMR and RfR cancel out, with ERP representing an inflation-free premium equal in both nominal and real terms.

Where the ERP is measured relative to long-term government bonds rather than short-term bills, it is also important to acknowledge that the resulting estimate may be subject to a systematic downward bias. This was apparent in the 1982–2021 period, which DMS describe as the 'golden age of long-term bonds', during which long-term bond returns were driven by falling interest rates rather than risk premia, thus depressing the measured ERP at a potentially greater rate than the fall in 'true' required returns.[21]

Figure 2.5 shows the historical returns on long-term and short-term government bonds for the four largest economies (USA, UK, Germany, and Japan) included by DMS in their World portfolio, which shows a clear divergence in the returns on long-term and short-term bonds across 1982–2021.

[19] Competition and Markets Authority (2026), 'Final Determinations Volume 4: Allowed return - chapter 7', 10 March, paras 7.398–7.436.
[20] Arithmetic difference leads to an underestimate as it does not account for the interaction term. Geometric difference (using the Fisher equation) is how DMS calculate the ERP, which they state leads to ERP estimates that are invariant to currency and/or inflation. Dimson, E., Marsh, P.R. and Staunton, M. (2002), 'Triumph Of The Optimists. 101 Years of Global Investment Returns, p. 164.
[21] Dimson, E., Marsh, P.R. and Staunton, M. (2024), 'UBS Global Investment Returns Yearbook 2024', pp. 28 and 83.

Figure 2.5 Comparison of realised returns on short-term bills and long-term government bonds



Note: We first calculate, for each year, a simple average of the realised returns on short-term and long-term government bonds for the four largest economies included in the world market risk premium over the period under consideration (USA, UK, Germany, and Japan). These countries were identified on the basis of gross domestic product figures from Geiger, T. and Frieler, K. (2018) and the World Bank's World Development Indicators. From this we derive the five-year moving average for short-term and long-term government bonds. The chart is based on the DMS dataset for short-term bonds (very short-term treasury bills) and long-term bonds (long-maturity government bonds).
Source: Oxera analysis based on the DMS dataset. Dimson, E., Marsh, P.R. and Staunton, M. (2024), 'UBS Global Investment Returns Yearbook 2024'. For the definition of short-term and long-term government bonds, see Dimson, E., Marsh, P.R. and Staunton, M. (2024), 'UBS Global Investment Returns Yearbook 2024', p. 15.

Where the RfR is derived from current market yields, using a long-term bond-relative ERP approach may introduce an internal inconsistency into the CAPM that leads to a systematic underestimation of the cost of equity. DMS is explicit that this distortion is not resolved by taking a longer historical average, as this will still assign substantial weight to the 'golden age' period. As a result, DMS recommends measuring the ERP relative to short-term bills either directly or considering the prevailing term structure for forward-looking purposes.[22] We encourage the UKRN

[22] In the German context, DMS stated: 'DMS thus reject Bundesnetzagentur/Frontier's recommendation to use the MRP on the DMS World index relative to bonds on two fundamental grounds. First, the CAPM mandates use of a risk-free rate, and bonds are far from risk free, especially historically. Second, and even more importantly, the historical MRP relative to bonds incorporates a term premium – that for unrepeatable historical reasons – is well above the

to consider additional research into this area to establish the existence of any bias.

Alternative methodologies to using a historical average ERP allow for ERP estimates to reflect current and forward-looking market conditions rather than historical averages. The principal Forward-looking ERP approaches are as follows.

- **ERP implied by discounted cash flows**: Kaserer, Damodaran and the Bank of England (BoE) each propose estimating the ERP by solving for the implied discount rate that equates the present value of expected future dividends or cash flows of a market index to its current market price, with the RfR subtracted to yield a forward-looking ERP.[23] Kaserer and the BoE employ a dividend discount model (DDM) framework: (i) Kaserer forecasts the aggregate dividends of all index constituents over a three-year forecast horizon before applying a terminal growth rate anchored to the earnings retention rate, ensuring that long-run profitability remains economically plausible, and (ii) the BoE proposes an improved DDM that extends the standard approach.[24] Damodaran adopts a similar approach but applies broader expected free cash flows to equity rather than only dividends, producing an ERP estimate that reflects current market prices, growth expectations, and investors' required compensation for risk.
- **Excess CAPE yield**: Shiller argues that the ERP can be inferred from equity market return expectations derived from valuation multiples.[25] Shiller computes the cyclically adjusted price-to-earnings (CAPE) ratio, defined as the ratio of the current price of a stock or an index to the ten-year average of realised earnings

prospective term premium today. The MRP relative to bonds thus appreciably underestimates the prospective required risk premium. Our recommendation is clear. The historical MRP on the DMS World index should be measured relative to bills. This is the only sensible approach if it is to be used in forward looking projections.', Dimson, E., Marsh, P.R. und Staunton, M. (2021), 'Assessment of Bundesnetzagentur's/Frontier's position on a DMS-based MRP', 24. August, p. 13.

[23] Kaserer's approach is described and implemented empirically by Fenebris for a range of markets, including the UK. See: https://www.market-risk-premia.com/gb.html (last accessed 28 July 2026). The BoE approach is described in Bank of England (2017), ' Quarterly Bulletin 2017 Q2 - Topical article -An improved model for understanding equity prices'. Damodaran's approach is described in Damodaran (2026), 'Equity Risk Premiums (ERP): Determinants, Estimation, and Implications', 5 March, pp. 90–125.

[24] The BoE makes three extensions: first, the model incorporates share buybacks alongside dividends; second, it allows long-term growth expectations to vary over time rather than fixing them at a constant terminal rate, by setting the long-term dividend growth rate equal to the five-year ahead GDP growth forecasts; third, it accounts for the index's exposure to overseas markets, producing more accurate long-term growth forecasts for internationally diversified indices.

[25] The CAPE ratio is discussed in Campbell and Shiller (1988) 'The Dividend-Price Ratio and Expectations of Future Dividends and Discount Factors', *The Review of Financial Studies*, **1 (3)**, pp. 195–228. The methodology to compute the ERP is available here: https://shillerdata.com/ (last accessed 28 July 2026).

per share (EPS). Shiller then proposes estimating the ERP by subtracting a contemporaneous estimate of the RfR from the inverse of the CAPE ratio, the 'excess CAPE yield'. This methodology produces a forward-looking ERP estimate that adjusts for cyclical variations in earnings.

- **Option-implied approach**: Martin argues that option prices provide a market-based, forward-looking measure of investors' required returns. Martin constructs a volatility index, SVIX, from index option prices and demonstrates that the square of SVIX constitutes a lower bound on the expected market ERP.[26]
- **CDS-based approach**: Berg and Kaserer argue that the current ERP can be inferred from credit market prices.[27] They demonstrate that the difference between the risk-neutral default probability implied by credit default swap (CDS) spreads and the corresponding physical default probability provides information about the market price of risk. Combined with estimates of asset correlation and asset volatility, this information can be used to derive an implied ERP.

While some approaches, such as option-implied and CDS-based are technically demanding, others are relatively straightforward to implement—the ERP implied by discounted cash flows requires only estimates of forecasted aggregate cash flows or dividends for market index components, which are widely accessible, while the implied CAPE requires only current index price data and ten years of historical EPS observations.

Overall however, these observations reflect a key challenge with Forward-looking ERP approaches—these cover a wide range of methodologies resulting in a wide range of estimates. This heightens the regulatory challenge, as it is not clear which approach is the more accurate or robust.

However, **Forward-looking ERP approaches have value as cross-checks**—applied alongside the primary TMR estimate, they can provide a useful indication of whether the allowed return remains broadly consistent with current market conditions, and can help identify cases where the primary approach may be producing an implausible result.

[26] Martin, I. (2017), 'What is the expected return on the market?', *Quarterly Journal of Economics*, **132**:1, pp. 367–433.
[27] Berg, T. and Kaserer, C. (2013), 'Extracting the Equity Premium from CDS Spreads', *The Journal of Derivatives*, **21:1**, pp. 8–26.

2.4.3 Option 3: Blended TMR and ERP

Another option is to combine the Stable TMR and Stable ERP approaches by applying explicit weights to each, deriving a blended TMR estimate that draws on the strengths of both methodologies. This is effectively the approach adopted by the CMA panel in its PR24 Final Determinations, which placed equal weight on a Stable TMR estimate and a Stable ERP-implied TMR estimate, resulting in an implicit 50:50 blend.

The CMA's rationale was that neither approach alone was sufficient to produce a credible estimate of the required return on equity across the range of interest rate conditions observed in recent years, and that a combination of the two would better reflect the uncertainty around the true relationship between TMR, RfR and ERP, while supporting an allowed return that was conducive to the raising of investment capital.

This highlights an important practical advantage of this approach: **it provides a transparent and deliberate framework for the combination of evidence from different methodologies, based on the regulatory view**. As the simple average performed by the CMA is not necessarily the most appropriate across time and sectoral circumstances, the calibration of the weights applied to each of the Stable TMR and Stable ERP should instead be grounded in sector-specific judgements around the ideal balance between stability and responsiveness in the allowed return, having regard to the investment needs of each sector.

As a starting point, given the preference of infrastructure investors for stability in allowed returns, a higher weight on the Stable TMR component would better reflect the case for anchoring the allowed return while still preserving meaningful responsiveness to changes in macroeconomic conditions.

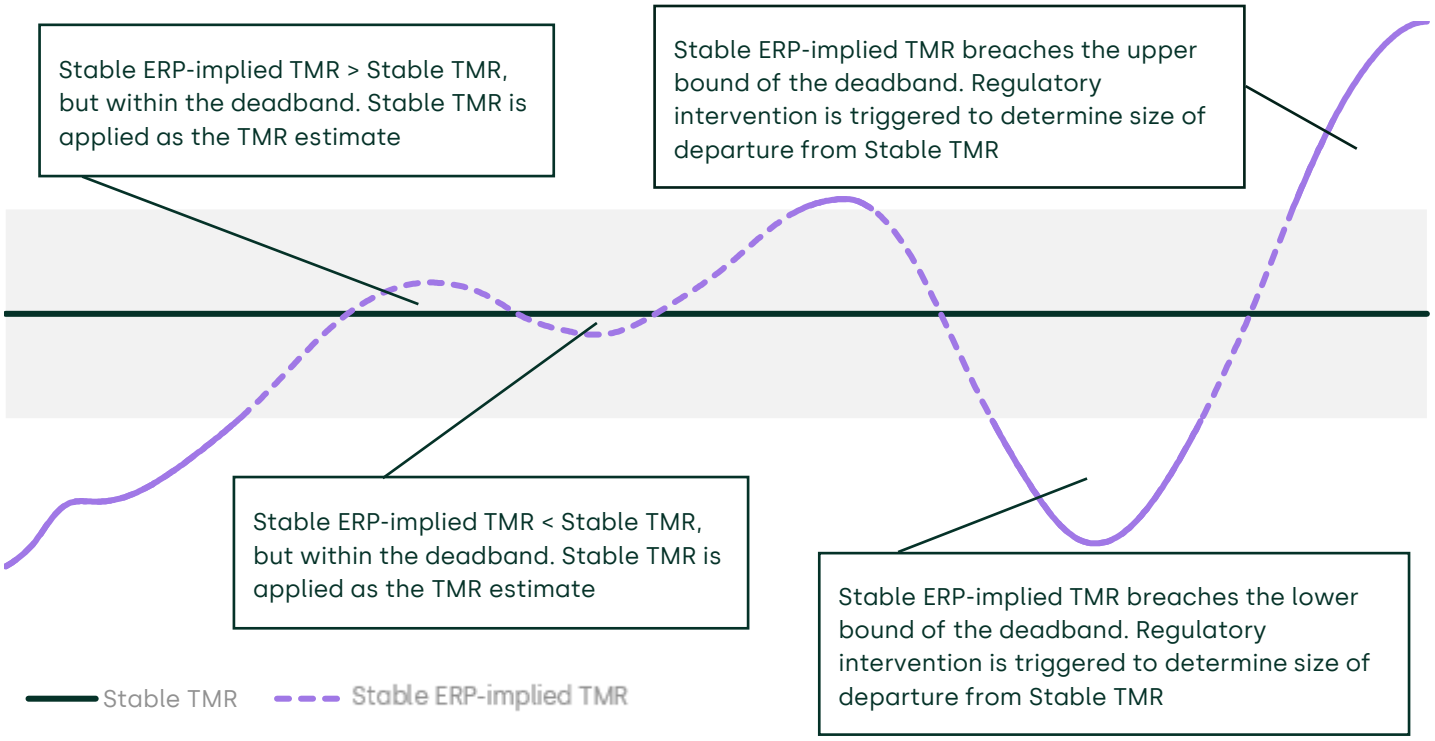
2.4.4 Option 4: TMR deadband

The TMR deadband approach builds on Options 1 and 2, and is an extension of Option 3, recognising that a reasonably practical regulatory approach is needed that responds to market conditions and tail risks, yet does not adjust on a one-to-one basis with volatile interest rates.

Under this approach, a central or target TMR estimate is established using the Stable TMR rooted in historical ex post long-run evidence. As markets update, an implied TMR is calculated based on the Stable ERP approach described in Section 2.4.2. The size of the deviation between the Stable TMR and the Stable ERP-implied TMR then informs the required regulatory action.

This approach comprises setting a symmetric deadband or corridor around the Stable TMR estimate, as shown in Figure 2.6. Where interest rate movements are moderate such that the Stable ERP-implied TMR falls within the shaded area (i.e. the deadband), no further regulatory action is required, and the Stable TMR is applied in estimating the allowed return. Where a tail risk occurs however, and Stable ERP implies a TMR materially different to the central target, this triggers regulatory intervention to determine what movement away from the Stable TMR estimate is necessary. For example (and as illustrated in Section 2.5), this regulatory intervention could include applying a blend of the Stable TMR and Stable ERP-implied estimates, once the deadband is breached.

Figure 2.6 Illustrative example of the TMR deadband



Source: Oxera analysis.

Such an approach preserves a degree of stability in periods of 'normal' volatility, while allowing the allowed return to respond, albeit on less than a one-to-one basis, to material shifts in the interest rate environment caused by tail risks. Crucially, **like the Blended TMR and ERP, this approach is a transparent and rules-based formalisation of the prevailing regulatory approach**—the Stable TMR is the preferred measure, but requires regulatory intervention to respond to tail risks to secure financeability and investability. This is especially true if we

consider that the deadband functions in much the same way as a TMR range would.

A key question is over the calibration of the boundaries forming the deadband, and what action should be taken once the deadband is breached to determine the movement away from the Stable TMR estimate. **By design, the width of the deadband and subsequent intervention would be a function of regulatory judgement reflecting the intended degree of responsiveness to market conditions.** For example, where rates are high and investments required, a narrower deadband or applying greater weight to the Stable ERP-implied TMR in a Blended TMR and ERP approach may be beneficial. However, we consider that to ensure regulatory consistency over time, it is preferable for the calibration of the deadband to be more persistent while allowing for more frequent updates to the calibration of subsequent intervention.

2.4.5 Option 5: Embedded cost of equity

Another approach is the embedded cost of equity framework which is designed to satisfy two objectives that are otherwise in tension: providing investors with the return certainty they require over a longer time horizon, whilst ensuring that the allowed return at each price control settlement reflects prevailing market conditions at that investment point.

Under this approach, the regulatory asset base (RAB) is disaggregated into distinct tranches, each of which is remunerated at a separate allowed return. In practical terms, this is similar to the cost of debt indexation as currently applied by Ofgem. A cost of equity allowance would be calculated annually and applied to all RAB additions within a given year as a discrete cohort—in essence, representing a RAB-weighted cost of equity allowance through time. This return then remains contracted and fixed up to the life of the assets within that cohort, providing the long-duration return certainty that infrastructure investors typically require.

Importantly, subsequent cohorts are remunerated at the cost of equity applicable to contemporaneous market conditions, ensuring that new investment is attracted on terms that are sufficient in each year rather than those prevailing from a prior period.

However, this approach may also lead to increased variability in the required rate of return across regulated firms, as capital expenditure profiles (and wider risks) vary by company across price control periods. Further, because cohorts of materially different sizes raised at different times will attract different returns, it may give rise to significant

variation in the blended allowed return over time, making point-in-time comparisons of allowed returns more complex for investors, regulators, and customers.

2.5 Final recommendation

In view of regulatory objectives, the approach to estimating the TMR must be practical in that it preserves a degree of stability, yet is sufficiently responsive to shifts in market conditions so as to ensure companies can attract and retain capital, and that customers do not pay more than is necessary.

This has been indirectly achieved in the past, mostly as **the Stable TMR approach has been applied without a clear framework signifying when and what regulatory interventions should be made.** To respond to the UKRN consultation question and ensure subsequent guidance provides for credible regulatory policy, it could be helpful for regulators to adopt a more explicit approach given sector- and time-specific investability and financeability needs.

We recommend an estimate of TMR that is relatively stable through time, yet with sufficient policy flexibility to respond to significant changes in market conditions. This can be achieved with the following regulatory policies.

- A weighted average of the Stable TMR and Stable ERP approaches (Option 3);
- Keeping TMR constant unless the Stable ERP-implied TMR moves outside a deadband centred on the Stable TMR (Option 4); or
- An 'embedded cost of equity', where distinct asset tranches are remunerated at separate allowed returns (Option 5).

Crucially, regulatory policy which weights between the Stable TMR and Stable ERP approaches in order to balance stability and responsiveness implicitly assumes a negative, stable and symmetrical relationship between the ERP and RfR. This is clearly a simplified and imperfect model of how the TMR varies over time. Therefore, **we recommend that while regulators should have discretion to vary the weights over time and across sectors, they be explicit about the weights they are applying and why they have chosen them.**

We also recommend that the relationship between the RfR, TMR, and ERP be investigated in greater detail, with regulators consulting on how specific policy choices (e.g. calibration of the weights, size of deadbands) respond to this.

3 Challenge #2: Estimating the return required by the notional company

Beta estimation for regulated network and infrastructure utilities is typically constrained by the limited pool of listed comparators. Standard practice is to identify companies listed on a stock market that operate in the same sector as the notional company and use estimates of their betas. Those comparators should be 'pure plays' which closely match the profile and risks of the notional company.

Where market evidence of bias does not exist then using the betas of listed companies from the same sector is the appropriate approach. However, where there is clear market evidence that the betas of listed companies from the same sector are biased estimates of the beta for the notional company, this bias should be corrected.

In this section, we discuss the key principles for setting an appropriate notional beta that is reflective of the sector characteristics and is consistent with academically robust estimation principles.

3.1 Definition of the notional company

The notional company is a regulatory construct, defined by the assumptions that regulators make about the efficiently operated firm. By definition, there is no expectation that the notional company will systematically out-perform or under-perform. The expected return on equity is equal to the allowed return on equity. The market value of the company equals the value of its RAB.

Estimation of the beta for the notional company is constrained by the availability of companies that operate in that sector and are listed on an equity market. These listed companies (or 'pure plays') provide the best available data on how investors price sector risk. In many cases, using the betas of these companies to set the notional company beta is the appropriate approach. This reflects the decision by the CMA in the NATS (En Route) Plc regulatory appeal to use beta data mostly based on businesses that are in sufficiently comparable sectors.[28]

However, where there is market evidence that one of more of the sector comparators is expected to systematically out-perform or under-

[28] Competition and Markets Authority (2020), 'NATS (En Route) Plc / CAA Regulatory Appeal – Final Report', para. 13.71.

perform the regulatory assumptions, these comparators clearly diverge from the definition of the notional company. The following subsections explain why this expectation of out-performance or under-performance results in the measured betas of the comparators being biased estimates of the beta for the notional company. We also put forward recommendations for how to correct this bias.

3.2 Revisiting the CAPM beta—risks and expected value

Within the foundational CAPM literature, the discount rate applicable to a given asset is not an exogenous parameter to be selected and applied, but rather an endogenous feature of the asset itself, derived from the characteristics of its underlying cash flows. Lintner (1965) was explicit on this point, warning that those who seek a discount rate to apply to expected values 'will find that the appropriate discount rate is unique to each individual company in a competitive equilibrium,' and that 'it is a derived rather than a primary variable'.[29]

This endogeneity thus has fundamental consequences—**expected out-performance or under-performance by a company affects its beta and cost of capital**. Therefore, robust cost of capital estimation requires a consideration of the risks and valuations of the comparator sample relative to the definition of the notional company. These relative risks can differ greatly: for example, due to the 'initial endowment' problem in the water sector, each company may be significantly different from each other and the notional company.[30]

This is demonstrated clearly in a key finding of the CAPM literature: **it is not simply exposure to market risk that matters for expected returns—rather what matters in cost of capital estimation is the exposure to market risk per unit of expected company value**. This point is evident in Fama (1977) which shows that the ratio of the covariance of the value of the firm and the market to the expected value of the firm is the only source of difference in the expected returns for different firms.[31]

[29] Lintner, J (1965) 'The Valuation of Risk Assets and the Selection of Risky Investments in Stock Portfolios and Capital Budgets,' *Review of Economics and Statistics,* **47**:1, pp. 27–28.
[30] As companies in the water sector are localised regional monopolies, there can be significant differences in natural circumstances and inherited infrastructure (the 'initial endowment' problem) meaning that companies can face varying degrees of operational challenges.
[31] The ratio $\mathrm{cov}(\tilde{V}_{it}, \tilde{V}_{mt})/\mathrm{E}(\tilde{V}_{it})$ represents 'the ratio in which the firm produces contributions to the aggregate risk and the expected value of invested market wealth'. See Fama, E. (1977), 'Risk-Adjusted Discount Rates and Capital Budgeting under Uncertainty,' *Journal of Financial Economics* **5**, p.7.

This interaction between company value, cost of capital, systematic and non-systematic risks is explained intuitively in the work of Babenko et al.

'To understand why firm-specific shocks are useful as conditioning information, consider a firm with two divisions. Suppose the profit of the first division depends exclusively on idiosyncratic profitability shocks and the profit of the second division is driven only by systematic shocks. This firm can be viewed as a portfolio of a zero-beta asset and a risky asset. When a positive idiosyncratic shock occurs, the size of the zero-beta asset increases, making it a larger fraction of the total portfolio value. As a result, overall firm beta decreases, as do expected stock returns. Therefore, any firm characteristic correlated with the history of cash flow shocks can help to explain expected stock returns.'[32]

Johnstone and Grant have since operationalised this via the 'Lintner ratio', and demonstrated that 'the firm's CAPM cost of capital is monotonically decreasing in E[X]'.[33] Johnstone and Grant define the Lintner ratio as:[34]

$$\Lambda = \frac{\text{cov}(X_i, r_M)}{E[X_i]}$$

and derive the following relationship between the CAPM beta and the Lintner ratio:[35]

$$\beta_i = \frac{R_f}{\text{var}(r_M)} \times \left[\frac{E[X_i]}{\text{cov}(X_i, r_M)} - \lambda\right]^{-1}$$

where $E[X_i]$ is the firm's expected payoff; $\text{cov}(X_i, r_M)$ is the covariance of that payoff with the market return; $R_f = 1 + r_f$; and $\lambda \equiv \frac{(E[r_M] - r_f)}{\text{var}(r_M)}$ is the market price of risk. The numerator, $R_f/\text{var}(r_M)$, is a market-level constant identical for all firms. All cross-firm variation in beta thus flows through the denominator bracket alone: holding $\text{cov}(X_i, r_M)$ fixed, a higher $E[X_i]$ produces a larger bracket and a lower beta.

This ratio implies that a change in the expected payoff for the firm leads to a change in the cost of capital even in the absence of a change in the

[32] Babenko, I., Boguth, O. and Tserlukevich, Y. (2016), 'Idiosyncratic Cash Flows and Systematic Risk', *Journal of Finance* **71**:1, February, pp. 425–426.
[33] Johnstone, D. and Grant, A, (2024) 'Zero-Beta Risks and Required Returns: ESG and CAPM,' *Financial Management* **54**, p.39.
[34] Ibid., p.40.
[35] Ibid., p.40.

payoff covariance with the market. **It is thus the Lintner ratio, rather than covariance of returns in isolation, that serves as the fundamental determinant of the cost of capital.**

It follows directly that expected company value and cost of capital is shaped not only by systematic market risks but also by the full range of risks a company faces.[36] For example, Johnstone and Grant demonstrate that zero-beta risks—risk with no correlation with the market return—affect the firm's Lintner ratio, and hence its cost of capital, whenever the firm's expected payoff is altered.[37] In other words, a risk that reduces expected cash flows, even if uncorrelated with market conditions, raises the ratio of payoff covariance to payoff mean, therefore increasing the firm's equilibrium discount rate. This finding is a direct implication of the pricing algebra set out by both Lintner and Fama.

A corollary follows for the comparison of firms. For any two firms with the same payoff covariance with the market, the firm with the higher expected value will have the lower Lintner ratio and, accordingly, the lower cost of capital.[38]

It can thus be concluded that, **holding covariance with the market constant, a more profitable firm—one generating a higher expected payoff—will exhibit a lower cost of capital**. Where the covariance with the market returns for the two firms differs, the cost of capital is directly affected through the usual transmission channel.

This mechanism applies directly to a regulatory setting and the definition of the notional company. A comparator company that is expected to outperform its regulatory allowance generates systematically higher expected cash flows than the notional company that performs in line with its allowances. Given the same underlying covariance with the market return, the outperforming company will therefore have a lower Lintner ratio and, by the logic set out above, a lower asset beta and a lower cost of capital.

[36] It is only in looking at returns at the market portfolio level (as espoused in textbook CAPM literature) that the CAPM assumption of complete diversification away from non-systematic risks holds. At the asset level however, as shown here, non-systematic risks affect an asset's equilibrium cost of capital.
[37] Ibid., pp. 35–36.
[38] This is a direct result of both Lintner's (1965) formulation and Fama's (1977) pricing specification. Johnstone and Grant (2025) confirm the same implication: 'provided that the firm has positive covariance with the market, its cost of capital $E[R] \equiv E[X]/P$ is monotonically decreasing in $E[X]$,' such that 'an increase in the firm's expected cash flow is enough of itself to warrant a drop in its risk-adjusted discount rate'.

This has a direct bearing on the selection and weighting of comparators in regulatory beta estimation. **A beta sample dominated by companies that consistently outperform their regulatory allowances will exhibit a systematic downward bias relative to the cost of capital appropriate for a notional company that performs in line with regulatory assumptions**. An empirical example of this is shown in Section 3.3.

A similar impact on the cost of capital can also be described through the concept of operating leverage. One established definition of operating leverage is the ratio of the present value of the firm's fixed costs to the market value of its assets.[39] The mechanism follows the same principle as financial gearing—just as a firm with a higher proportion of debt relative to its market value bears greater financial risk, a firm with a higher level of fixed costs relative to its market value is inherently riskier, all else being equal. Conversely, for the same level of fixed costs, a firm with a higher market value has lower operating leverage and, therefore, a lower asset beta. In a regulatory setting, a comparator firm that outperforms its regulatory allowance is likely to exhibit either lower effective fixed costs relative to its regulatory allowance, a higher market value, or both.

3.3 Implications for setting the allowed return on equity

Practitioners, including regulators, should recognise and address these effects and not treat the asset betas of listed comparator firms as directly representative of the notional company's risk exposure without adjustment for structural differences in expected performance. Failure to do so will result in setting a return allowance that is systematically different to the cost of capital for the notional efficient company.

Regulators have a range of options for deriving a beta that reflects the risk and expected performance of the notional company, including: (i) selecting a beta point estimate above or below the mid-point of the estimated range, (ii) applying differential weights to individual comparators within the sample, or (iii) making quantitative adjustments where there is clear market evidence of expected out-performance or under-performance.

[39] Mandelker, G and Rhee, S (1984), ''The Impact of the Degrees of Operating and Financial Leverage on Systematic Risk of Common Stock', *Journal of Financial and Quantitative Analysis*, **19**:1, pp. 45–57.

The next section outlines how direct quantitative adjustments to beta could be calculated based on comparing the market values of listed companies to the values of their regulatory asset betas.

3.3.1 Quantifying the bias in notional beta estimation

The theoretical principles explained above can be combined with observable market data to quantify the downward beta bias that arises when comparator companies trade at a premium to their RAB.[40] The market-to-asset ratio (MAR) provides a natural empirical input for this analysis. A company trading at a MAR above 1x signals that the market attributes greater value to its future expected cash flows than the RAB alone would imply, reflecting anticipated outperformance relative to the regulatory assumptions for the notional company.

Within the Johnstone and Grant (2025) framework, this premium corresponds directly to a higher expected payoff—and, for a given payoff covariance with the market, to a lower Lintner ratio and hence a lower asset beta.

To demonstrate how a practitioner may operationalise this, we construct a scenario based on reasonable market parameters for the UK economy and a regulated network. The market parameters are calibrated as follows.

- $r_f = 5.604\%$, computed from 20-year nominal gilt yields;
- $E[r_M] = 10.96\%$, estimated as the long-run average nominal TMR from the DMS dataset;
- $\text{var}(r_M) = 0.043$, estimated from the DMS dataset; and
- $\lambda = 1.2437$, derived from the parameters above.

The notional company is then set at $E[X]_{\text{notional}} = 100$, which by construction corresponds to a MAR of 1.0x, with no out-performance or under-performance premium assumed. A target asset beta of 0.35, representative of recent regulatory decisions for utilities, is imposed. The beta equation above is inverted to recover the implied payoff covariance:

$$\text{cov}(X, r_M) = \frac{E[X]}{\frac{R_f}{(\text{var}(r_M) \cdot \beta)} + \lambda} = \frac{100}{71.30656} = 1.402395$$

[40] The same calculations can be performed for a company trading at a discount to the RAB.

This covariance is held fixed throughout, representing the unchanged systematic risk of the regulated business. The only variable across MAR scenarios is $E[X]$, set equal to MAR × 100 for each comparator.

We then vary the expected firm payoff in proportion to increasing MAR premia—in other words, a 10% MAR premium corresponds to an expected payoff of 110, relative to the payoff of 100 assumed for the notional company. Then, using the outlined CAPM formulations, the additional MAR premium may be translated to an implied impact to the underlying asset beta, as shown in Table 3.1.

Table 3.1 Illustrative example of the relationship between MAR premium and asset beta

MAR premium (%)	Underestimate of notional asset beta
0	0
10	0.03
20	0.06
30	0.08
40	0.10
50	0.12

Source: Oxera analysis.

This illustrative analysis suggests that the impact of consistent outperformance versus the notional company, as proxied by a MAR premium, leads to a material decrease in the implied cost of capital relative to the notional company that performs in line with the regulatory allowances.

Whether regulators choose to refine and reflect this directly or through the application of judgement to select a beta point estimate above the middle of the range, this quantification demonstrates that **the impact of the difference in performance and profitability of comparator companies relative to the notional company is too material to ignore**. This remedy should converge to a stable equilibrium. All else equal, the increase in valuation of the listed company resulting from an upward adjustment to the allowed return will reduce the Lintner ratio of that company and hence its asset beta.

3.4 Final recommendation

Foundational CAPM literature shows that the **cost of capital and beta is shaped not only by systematic market risks but also by expected company value, which itself is affected by the full range of risks a company faces.** This implies that the beta of a listed company that is expected to out-perform or under-perform the assumptions that regulators make about the efficiently operated firm will be a biased estimator of the notional company beta.

Evidence provided in this report shows that a listed company with a market value that is higher than the value of the regulated asset base (RAB) would have a materially lower asset beta. This results in significant bias to the estimate of the cost of capital for the notional company.

Options exist for correcting this bias, including: (i) selecting a beta point estimate above or below the mid-point of the estimated range, (ii) applying differential weights to individual comparators within the sample, or (iii) quantifying the adjustment as illustrated in this report.

We recommend that regulators investigate this issue thoroughly and consult on the possible solutions.

4 Challenge #3: Setting a robust point estimate considering welfare impacts of underinvestment

The CAPM remains the accepted regulatory framework for estimating the cost of equity, and we do not advocate a departure from it in this report. The question we seek to answer is not whether to continue using the CAPM, but how to use it to set allowed returns for regulated companies.

The fundamental challenge is that the cost of equity is not directly observable from market data. The CAPM-implied cost of equity is a derived estimate subject to significant parameter estimation uncertainty and measurement error. The compounding effect of these individual uncertainties means that **the CAPM-implied cost of equity should be understood as a range of potential values rather than a precise figure**. Selecting a single point estimate from within a CAPM-implied range thus involves balancing the impacts on customer welfare of over-estimating and under-estimating the cost of equity, which are asymmetric.

4.1 Conceptual basis for welfare impacts of underinvestment

The welfare impacts from underinvestment mean that regulators are confronted with an asymmetric welfare loss function, as identified by Dobbs (2011).[41] Where the return allowance is insufficient and leads to underinvestment, it is customers who ultimately bear the associated costs, in the form of either a deterioration in the quality of service or the permanent loss of economic opportunity. The latter is particularly significant in the case of new customers who are unable to connect to, or access, the relevant network or service.

This dynamic is not sector-specific. In electricity networks and water utilities, delays to capital investment can, in addition to direct service deterioration, cause delays or permanent loss to broader economic activity that is dependent on infrastructure availability (data centre development and new property construction are illustrative examples). Similar costs arise in the airport sector, where insufficient investment may constrain capacity, lower service quality, and prevent expansion that would otherwise generate wider economic benefits. In these cases,

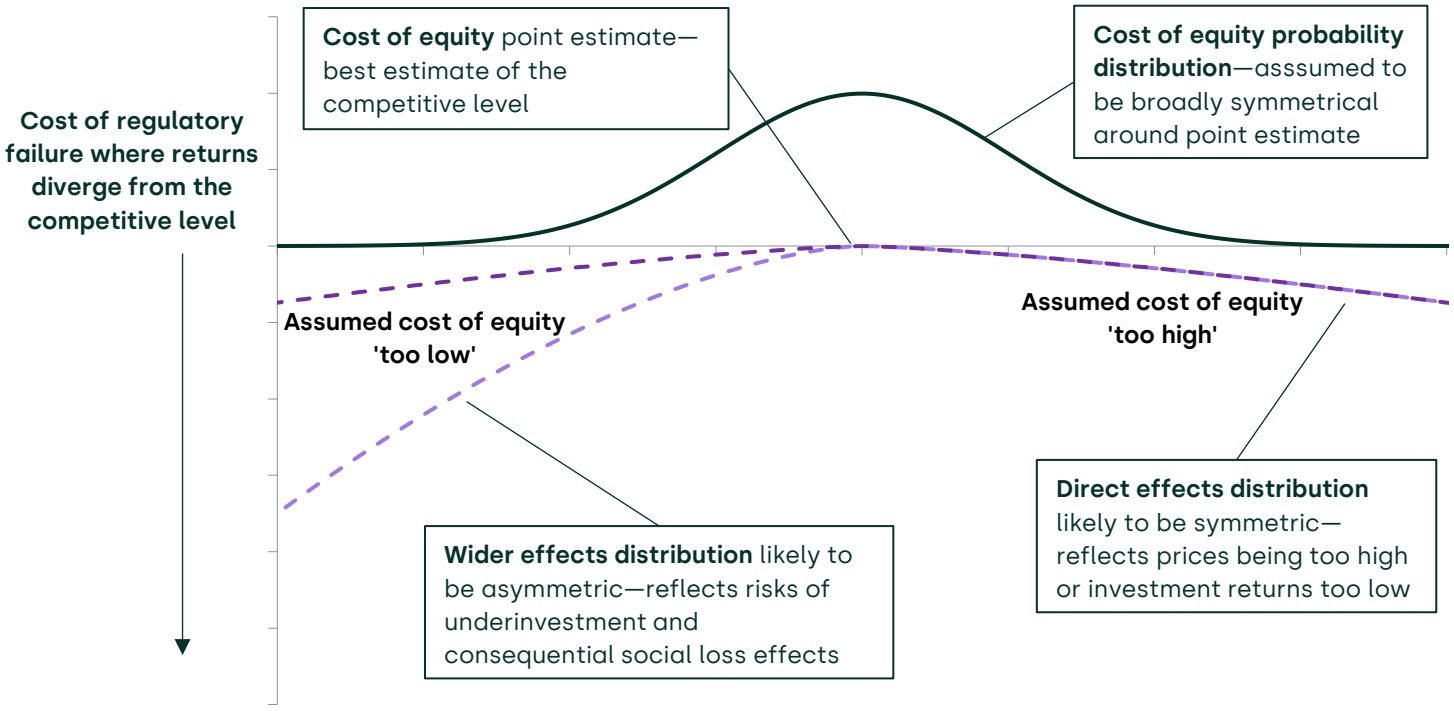
[41] Dobbs, I.M. (2011), 'Modelling welfare loss asymmetries arising from uncertainty in the regulatory cost of finance', Journal of Regulatory Economics, 39, pp. 1–28.

some of the harm to consumers and the broader economy may be irreversible, where economic opportunities are permanently forgone.

Relative to the potential costs of underinvestment, the cost of setting a return allowance that is marginally higher than the CAPM mid-point is considerably less material. Indeed, where any additional allowance serves to reduce the probability of an underinvestment outcome, it may be wholly justified on welfare grounds.

Figure 4.1 illustrates the social loss function concept. Even if the direct cost of over-estimating or under-estimating the allowed return is symmetrical around the actual, unobserved, cost of equity, the total downside risk from a shortfall in the allowed return is negatively skewed and increases sharply as the implied gap between the allowance and required return grows due to increased incentive to underinvest. Since the true level of cost of equity is unobservable, the regulator should seek to minimise the expected loss that can occur to customers. This supports that **UKRN guidance should reflect that regulators should not treat a mid-point estimate as the default estimate.**

Figure 4.1 Illustration of framework for evaluating welfare impact of underinvestment



Source: Oxera analysis, replicated from Oxera (2014), 'Input methodologies: review of the 75th percentile approach', 23 June, pg. 2, accessed: https://www.oxera.com/wp-content/uploads/2018/07/Oxera-review-of-the-75th-percentile-approach.PDF.pdf.

4.2 Factors affecting investment risk and consumer welfare

The welfare impact of underinvestment of the cost of capital decision is recognised in regulatory precedents. These include the CMA's PR19 and PR24 redeterminations, which acknowledged that the social and welfare impacts of underestimating the cost of capital such that it leads to delayed or abandoned investment are greater than the impact of modestly overestimating it.[42]

While this principle is accepted within the UKRN guidance, it considers that the significance of this effect is nullified by five factors affecting the decision to invest. Although these factors are salient in evaluating the risk of underinvestment, **they do not change the conclusion that the costs to consumers of setting the allowed return below the (unobservable) return required by investors far exceed the costs of modest overcompensation.**

This is consistent with the CMA's conclusions in its PR24 redeterminations: 'We recognise that there are other tools, including statutory obligations, […] which act to mitigate [underinvestment] risk, but we cannot be certain that these tools are sufficient on their own'.[43] We briefly reflect on each of the five factors raised by the UKRN guidance in turn.

Amount of investment

The scale of the required investment programme acts to amplify the welfare costs of underinvestment rather than to alter the fundamental asymmetry of expected outcomes. When the investment programme is large, any shortfall in committed capital translates into material foregone improvement in service quality or network resilience, and therefore into a more significant loss of consumer welfare. Crucially, asymmetric welfare impacts still apply even if investment (and underinvestment risk) is relatively low—per the CMA, '[…] externalities do not have to be large to justify a small difference in the WACC of, say, 0.1%, if that is expected over time to reduce the risk of underinvestment'.[44] It cannot, therefore, serve as a reason to discount the welfare impacts of underinvestment.

[42] Competition and Markets Authority (2021), PR19 Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited price determinations: Final report, 17 March, para.9.1276 and Competition and Markets Authority (2026), 'Final Determinations Volume 4: Allowed return - chapter 7', 10 March, paras. 7.762 and 7.767–7.769.
[43] Competition and Markets Authority (2026), 'Final Determinations Volume 4: Allowed return - chapter 7', 10 March, paras. 7.768.
[44] Competition and Markets Authority (2026), 'Final Determinations Volume 4: Allowed return - chapter 7', 10 March, paras. 7.766.

Statutory requirements

Statutory obligations are not an effective substitute for adequate financial incentives when it comes to securing new capital investment, as **they cannot compel investors to commit new equity at rates of return that fall below the required return on capital**. Furthermore, where existing investors are effectively required to accept returns below their required return, this may produce a permanent upward shift in perceptions of regulatory risk and, in turn, a structural step-up in the required return. As such, a short-term saving for customers from a lower allowed return may be more than offset by a long-run increase in the return that investors will require to commit capital to regulated assets in future.

Service delivery incentives

Unless incentive mechanisms are explicitly designed and calibrated to provide a positive expected uplift to returns, they offer no meaningful mitigation of the welfare impacts of underinvestment. Where incentive mechanisms are calibrated such that there is no expected out-performance or under-performance, the net expected contribution to returns is zero, and the risk of underinvestment remains unaddressed. Where incentive regimes are, in expectation, negatively skewed, the effective cost of capital for the regulated activity is increased, exacerbating the risk of underinvestment rather than alleviating it.

Separate treatment of large one-off projects

Large, discrete investment projects are subject to the same asymmetric welfare risks as investment within the main price control settlement. While the separate treatment of such projects may facilitate more precise calibration of the required return through competitive tendering processes and/or may permit a better alignment between regulatory and investment horizons, this does not address the broader investment challenge. **Where a price control settlement requires a substantial and sustained ramp-up in capital expenditure, the welfare impacts from underinvestment remain fully present** in respect of the wider programme.

Pricing freedom for new investments where competing infrastructure and/or regulation of legacy services constrains market power

This mechanism has theoretical merit where greater pricing flexibility for new investment can address elements of the welfare impact by allowing companies to generate returns closer to the return required by

investors. However, this is applicable only in a narrow subset of cases, where competing infrastructure or effective regulation of legacy services constrains market power. This prerequisite is not routinely met across regulated utility sectors. As such, **the relevance of pricing freedom is limited in the scope of regulated networks** and cannot be relied on as a general justification for discounting the welfare impacts from underinvestment.

4.3 Final recommendation

The draft UKRN guidance recommends using the mid-point of the estimated CAPM range as the central estimate for the cost of equity—which is unknown—and that regulators should only deviate from the mid-point if there are strong reasons. **While the guidance mentions the welfare impacts of underinvestment, it does not contain the crucial finding that consumer welfare is maximised by adopting a point estimate above the mid-point.** Indeed, the guidance gives the appearance of seeking to dismiss this important finding.

Although this finding is not new, it has become more important due to the following.

1. The increase in the scale of investment required across sectors is significant and will be sustained for many years.
2. The impact on customers of underinvesting has increased as infrastructure needs to be resilient to a heightened set of pressures, for example from climate change and security threats.

We recommend recognising in the guidance that in most if not all circumstances, **setting the allowed return at the mid-point of the estimated cost of capital range will result in lower consumer welfare than setting the allowed return above the mid-point.** A rigorous consideration of the evidence is needed to determine how far above the mid-point of the range the allowed return should be set.

5 Inflation

Where regulators set a CPIH-real WACC, the long-term inflation assumption is a key input, as nominal and RPI-real input data must be adjusted accordingly. As such, **defining the appropriate inflation assumption is a critical input into the cost of capital estimation**.

5.1 Informing the appropriate inflation assumption

Historically, a CPIH assumption of 2% drawn from the BoE's long-term CPI inflation target has been applied, effectively assuming that CPIH is equal to CPI over the long-term.

The consultation suggests this is no longer appropriate, given the Office for Budget Responsibility's (OBR) current assessment of a long-term CPIH-CPI 'wedge' of 0.4%.[45] Specifically, UKRN guidance states that in order to limit forecast risk, regulators should reflect recent evidence on inflation dynamics.[46]

However, it is not clear how relying on the current OBR forecast, without first considering the strength of evidence underlying it, ensures a more appropriate inflation assumption that minimises forecast risk. We consider that any change to the long-term inflation assumption requires a strong evidentiary basis to secure the predictability of the regulatory framework and ensure consistency with regulatory best principles. We encourage the UKRN to consider whether the current evidence base is sufficiently robust to support ruling out any figure at this stage.

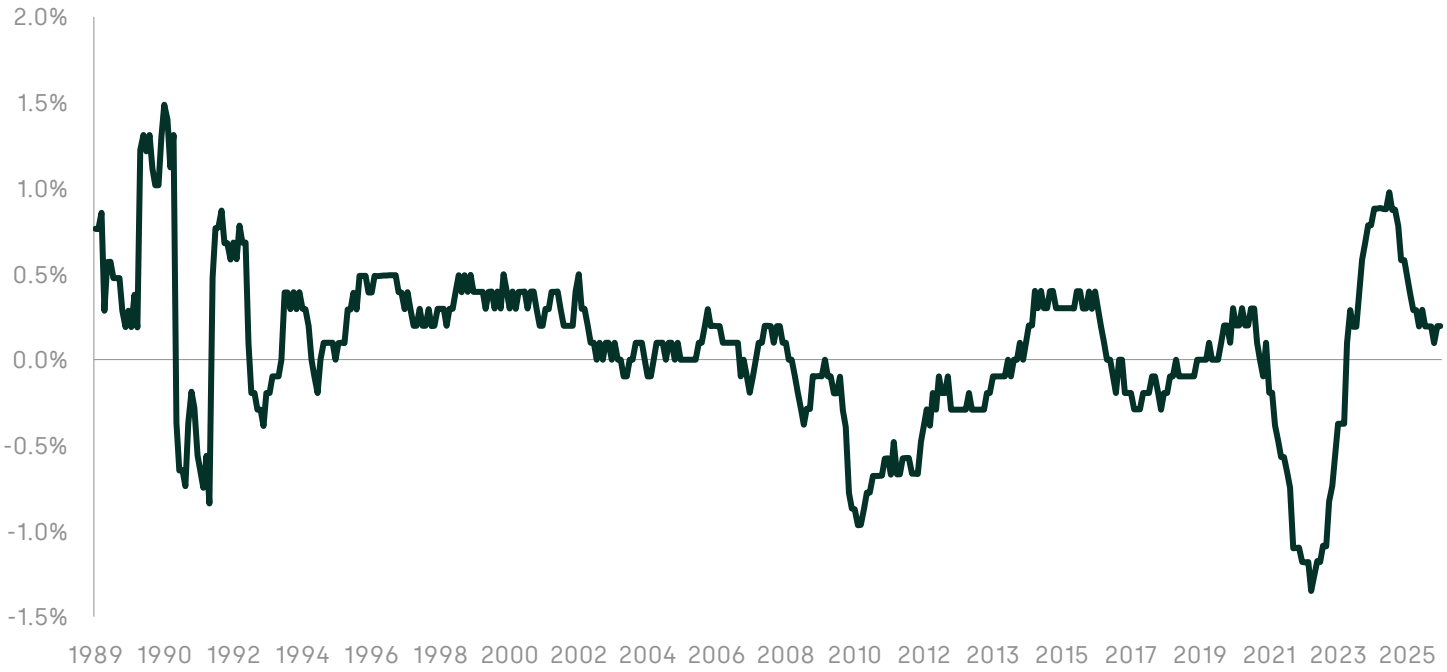
5.1.1 Historical outturn data indicates no persistent or material wedge

In an Oxera report for PR24, which looked at long-term inflation assumptions, our analysis of the historical long-run relationship between CPIH and CPI showed that any outturn wedge has not been systematic and has not been materially different from zero. Indeed, historical outturn data points to an often negative wedge across several long-term averaging windows—as recent as the four-year average to September 2025. The wedge remains persistently negative over averaging windows longer than three years, with the 20-year average at

[45] Office for Budget Responsibility (2024), 'The long-run difference between RPI and CPI inflation', October.
[46] UK Regulators Network (2026), 'UKRN Cost of capital: Review of guidance on methodology for setting cost of capital – consultation', 24 June, para. 136, accessed: https://ukrn.org.uk/app/uploads/2026/06/UKRN-Cost-of-Capital-guidance-review-consultation-June-2026.pdf.

around -0.11%, and near zero at 0.07% since the start of the ONS series in 1989—in particular, any historical wedge is not materially different from zero.[47]

Figure 5.1 CPIH–CPI wedge over time



Note: The series covers the period starting in January 1989 to May 2026 and is shown on a monthly basis.
Source: Oxera analysis based on ONS data.

Comparing the OBR's 40bps estimate against historical data reveals that it is a significant outlier, having been met or exceeded only 5% of the time over the last 20 years.[48] This is consistent with the CMA's finding in its PR19 redetermination that 'historical evidence suggests that UK [CPIH] inflation mean reverts to an average of 2% over time'.[49]

Historical evidence therefore does not reconcile with the OBR's long-term forecast of CPIH including a markedly positive CPIH–CPI wedge. Based on the monthly CPIH–CPI wedge observed in Figure 5.1, we

[47] Based on historical averaging to September 2025.
[48] Oxera (2025), 'The long-term inflation assumption in PR24', November, Table 3.3.
[49] Competition and Markets Authority (2021), 'Anglian Water Services Limited, Bristol Water plc, Northumbrian Water Limited and Yorkshire Water Services Limited Price determinations', March, para 9.29.

present the equivalent spread at selected percentiles over the full annualised outturn dataset from 1989 to 2025 in Table 5.1.

Table 5.1 CPIH–CPI average annual wedge at selected percentiles

Percentile	CPIH–CPI spread
P10	-0.38%
P50	0.05%
P87	**0.40%**
P90	0.41%

Note: The spreads are annualised based on the average of monthly CPIH–CPI spreads from January to December for each year. The series covers the period 1989–2024.
Source: Oxera analysis based on ONS data.

Our results indicate that a wedge of 40bps is firmly toward the upper end of historical experience with the overall range being nearly symmetrical around zero. Indeed, the median P50 of 5bps is not statistically different from zero, as it falls below the standard deviation of the wedge data series of 46bps. Table 5.2 shows a further breakdown of where a 40bps CPIH–CPI wedge sits within the historical distribution of annualised observed values across different averaging windows.

Table 5.2 Percentile of the 40bps CPIH–CPI spread within the distribution of annualised historical values

Timeframe	40bps wedge percentile
Three-year window	P86
Five-year window	P85
Ten-year window	P90
Twenty-year window	P95
Thirty-year window	P91
Complete series	P87

Note: The spreads are annualised based on the average of monthly CPIH–CPI spreads from January to December for each year. The series covers the period 1989–2024.
Source: Oxera analysis based on ONS data.

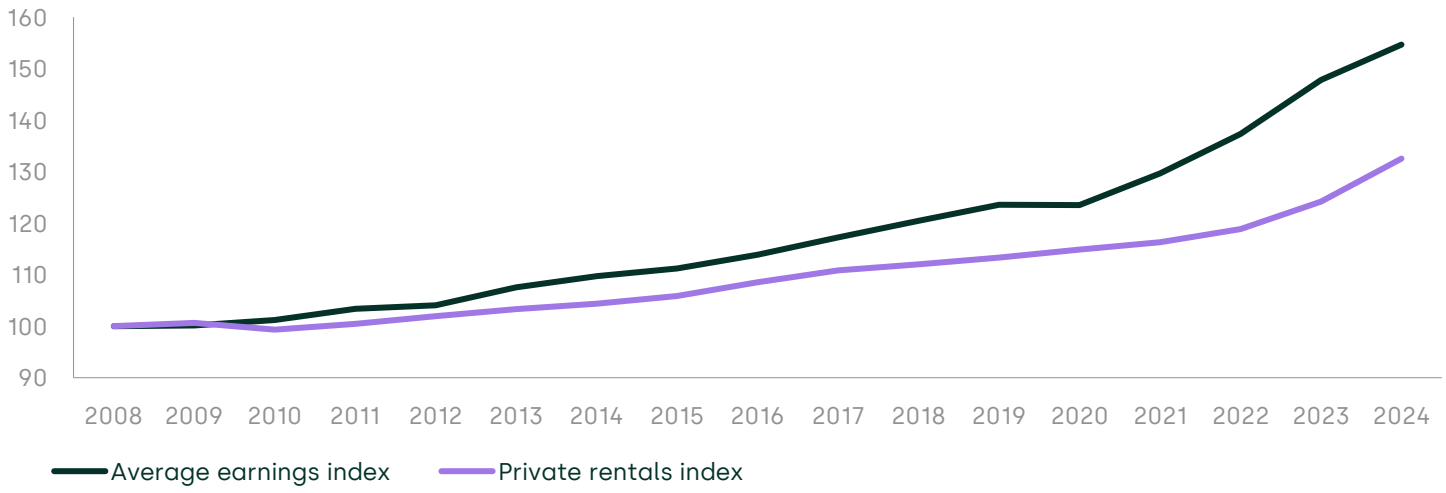
Across most timeframes, the 40bps wedge lies between the 85th and 95th percentiles, meaning that such a spread has only been met/exceeded around 5–15% of the time. Indeed, in no historical window observed does the OBR forecast become likelier than 13% in any one year. More importantly, over longer periods where short-term volatility is smoothed out—such as the 10- and 20-year windows—the wedge forecasted by the OBR is a significant outlier, sitting in the 90th to 95th percentile range.

Further, for the OBR's projected CPIH–CPI wedge to hold in the long run, two key assumptions must be true through time, as follows.

- Owner-occupier housing (OOH) costs must grow on a one-to-one basis with average earnings.
- The growth of both OOH and council tax must exceed CPI in perpetuity.

However, historical data shows that neither of these assumptions hold in practice—Figure 5.2 shows that, since 2008, OOH has grown at only 0.6 times the rate of average earnings.

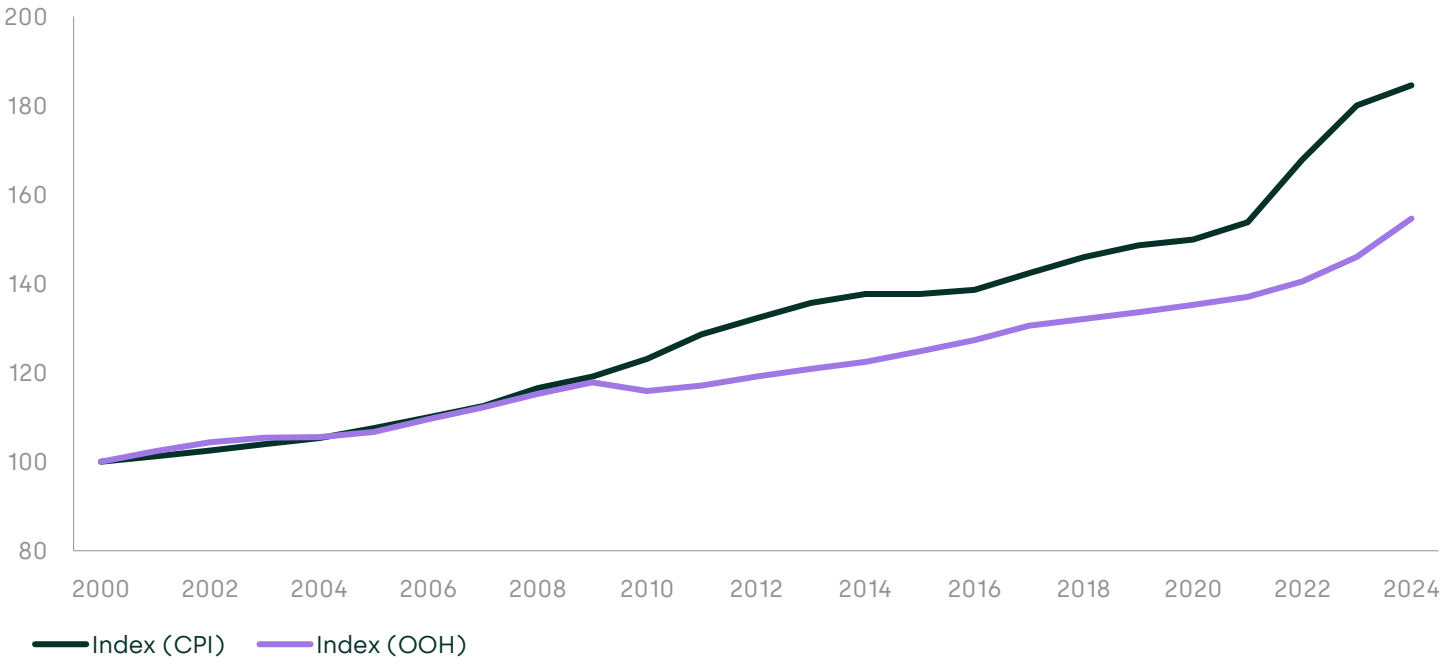
Figure 5.2 Outturn average earnings and private rental inflation (2008 = 100)



Note: We charted private rentals as the OBR argued that it tracks earnings over time. Had OOH been used instead, the results would have been the same. 2008 was the earliest data point in the OBR data, and extending the chart using ONS data does not lead to any greater support for the OBR assumption of one-to-one growth.
Source: Oxera analysis based on OBR data.

Addressing OOH costs, Figure 5.3 shows historical outturn OOH and CPI, as indices rebased to 100 in 2000. The data indicates that between 2000 and 2008, OOH grew broadly in-line with CPI, while from 2008 onwards OOH growth rates have generally lagged behind CPI.

Figure 5.3 Outturn OOH and CPI (2000 = 100)



Source: Oxera analysis based on ONS and OBR data.

5.1.2 The underlying parameters are challenging to estimate

Finally, the OBR's earnings growth assumption, which underpins its OOH projection, is itself derived from the sum of labour productivity and the GDP deflator. Both components carry considerable forecasting uncertainty. The OBR has itself acknowledged that:

'The outlook for trend productivity is one of the most important and uncertain forecast judgements. Successive past forecasts for trend productivity have proven to be too optimistic as productivity growth has continued to disappoint.'[50]

A further concern with relying on OBR's 2.4% CPIH assumption to rule out the 2% figure is that it produces internal inconsistencies when applied

[50] Office for Budget Responsibility (2025), 'Alternative scenarios for trend productivity', March.

alongside market-based evidence on inflation. When deriving the RPI-CPIH wedge using swap market data, the CMA found that applying the OBR's 40bps CPIH–CPI wedge to its swap-based estimate of CPI would imply a negative RPI–CPIH wedge, which it recognised as not credible.[51]

5.2 Final recommendation

Given the evidence above, there is no robust basis for the UKRN guidance to rule out any figure for a wedge at this stage. Instead, **UKRN guidance should encourage regulators to assess inflation evidence carefully and without prejudice at each price control, drawing on the full range of available sources, rather than ruling out a particular value or range of values as a cross-sector default.**

This would be more consistent with the guidance's aim of limiting forecast risk by promoting evidence-based and transparent decision-making, while preserving the regulatory flexibility needed to reflect genuine developments in inflation dynamics as they emerge.

[51] CMA (2025), 'Water PR24 References: Provisional Determinations, Volume 4: Allowed Return, Risk & Return', 9 October, para. 7.214.

Contact

Peter Hope
Partner
+44 (0) 20 7776 6621
peter.hope@oxera.com

oxera.com