RIIO-ED2 Cost of Equity Cross-checks

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1 Introduction and summary

In its RIIO-ED2 Draft Determination, Ofgem is seeking views on its cost of equity (**COE**) cross-checks in setting an allowed cost of capital for the price control.

This paper has been commissioned by the ENA to set out our views on Ofgem's cross-checks and its interpretation of the cross-check evidence. In this report, we focus on the Market-to-Asset Ratio (MAR) within Ofgem's set of cross checks, as this is the one we have the most concern on. We explore our concern with the way Ofgem interprets the results, and propose alternative ways to carry out cross checks based on market valuation metrics such as the MARs. In addition, we also propose other alternative cross checks that in our view should be taken into account in a more balanced set of cross checks that Ofgem can use for the cost of equity estimates.

Our key findings are as follows:

- In respect of Ofgem's MAR analysis:
    - Ofgem assumes that only a MAR close to 1 can confirm that a price control has been appropriately calibrated, but this only holds if a range of unrealistic conditions are fulfilled;
    - if Ofgem wishes to rely on a cross-check based on market valuations, then it is more appropriate to focus on relative valuation;
    - a range of market measures exist that can be used to support such an exercise, such as P/E ratio and EV/EBITDA; and
    - our analysis of this market evidence shows that regulated utilities are not relatively highly valued, contrary to Ofgem's conclusions from its MAR analysis, and therefore does not suggest that there is any underlying problem with regulatory calibration.
    - Network valuations are moving in line with wider market sentiment and sit where one would expect regulated utilities to sit within the wider market.
- The Dividend Growth Model (DGM) should be added to Ofgem's set of cross-checks and should be regarded as a superior measure to MAR.
    - The Dividend Growth Model (DGM) is a well-established, short-term market-implied, forward-looking methodology used for valuation assessment. DGM can also be used to estimate the implied the cost of equity given market valuation. It has the

benefit of being based directly on forward cashflows, and requires fewer assumptions to operationalise.

- □ While it should not be used alone to set allowed returns, it is a glaring omission from Ofgem's set of cross-checks.

- □ Applying the DGM to the five listed utilities in the UK reveals that Ofgem's proposed allowed rate of return in its DD is at the low end of the results derived from our low scenario. The overwhelming weight of evidence suggests that a higher level of return is appropriate.

- □ This directly contradicts Ofgem's view that cross-check evidence supports the lower part of its Step 1 CAPM range. If Ofgem had a properly constituted set of cross-checks which included the DGM then it would be clear that this claim is wrong.

- ■ Ofgem should also introduce a cross-check on longer term profitability, as this would provide a way to move away from reliance on short run market evidence, which can be volatile and may send signals that prove to be ephemeral.

  - □ To attract and retain capital, regulated businesses should have the opportunity to generate profits similar to comparable businesses (in terms of risk).

  - □ Given that Ofgem's cost of equity allowance effectively sets the allowed level of profitability, the cost of equity allowance should be broadly in line with observed average levels of profitability in the long-term.

  - □ We propose a cross-check based on Return on common Equity (ROE).

  - □ Our analysis shows that while interest rates have (until recently) been falling over a long period of time, ROE has not fallen in line, but has remained broadly constant.

  - □ This cross-check directly contradicts any argument that Ofgem's allowed return could or should be lower.

  - □ For the avoidance of doubt, we do not propose that this cross-check should be used to somehow set allowed returns. But it can be used as a cross-check of whether equity returns to networks are out of line with profitability in the wider market. All the evidence suggests they are not.

- ■ Lastly we reiterate our long standing view on cross-checks.

  - □ No cross-check is perfectly robust or reliable, which is why they are not considered a replacement for CAPM as the primary estimation method of the cost of equity.

  - □ All cross-checks will display some undesirable properties that markedly weaken their reliability.

  - □ Use of short run measures would wash a combination of "market sentiment" and "noise" into the regulatory determinations, weakening stability and predictability and harming investor confidence. All of these measures would introduce a new form of pro-cyclicality into regulatory determinations, which runs counter to the original intention of the RAV-based model.

- □ Reliance on cross-checks introduces a new form of regulatory discretion into determinations, i.e. how to interpret noisy, volatile and potentially contradictory cross-check evidence.
- □ For all these reasons, UK regulators have always consciously avoided using such short-term market-implied evidence to set the allowed equity return.
- □ We therefore recommend Ofgem to put less weight on short-term valuation based cross checks such as MAR analysis.

The rest of the paper is organised as follows.

- First, we set out our concerns with the way Ofgem proposes to interpret the MAR evidence in its cross-check, and outline why Ofgem's conclusions based on this cross-check are flawed. We propose alternative ways to carry out cross checks based on market valuation metrics that are similar in nature to MARs.
- Second, we propose the Dividend Growth Model as an additional cross check for Ofgem to consider,
- Third, we propose long-term profitability as an additional cross check that provides a useful perspective which does not depend on short-term market valuations.
- Finally, we discuss the balance of importance which should be ascribed to the CAPM (Step 1) vs cross-checks (Step 2) evidence.

2   Concern with Ofgem's MAR cross-check

Ofgem's approach to the MAR cross-check has remained the largely same as GD2/T2, but for the inclusion of a more refined model that sets out more explicitly the assumption on dividend pay-out ratio and RAV growth. The new analysis also includes additional evidence made available since the conclusion of the GD2/T2 Final Determinations and the 2021 Energy Appeals (published in December 2020 and October 2021 respectively).[1]

In simple terms, the MAR is the market value of a firm[2] over the value of its Regulated Asset Value (RAV). As such, the measure only exists for a very small number of regulated firms; in particular, UK regulated entities. Moreover, MAR figures for non-traded regulated utilities are only available on an infrequent basis, which is when UK regulated assets are sold (we refer to these as transaction MARs).

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[1]   Indeed, Ofgem claims that the same evidence considered in the GD and T determinations can be applied to the ED sector. Ofgem (2021) RIIO-ED2 Sector Specific Methodology Decision: Annex 3 Finance, para 3.60

[2]   The market value of a firm is generally referred to as its Enterprise Value.

Practical complications of interpreting the MAR evidence have been well documented.[3] These included:

- A lack of representative pure play comparators for the energy sector;
- Problems in assumptions made on expected operational outperformance of individual companies;
- Other factors that might influence the MAR in a private transaction such as value of sole ownership, winners curse, etc.

We do not repeat these arguments in this paper.

However, we have concerns over the key assumptions underpinning Ofgem's MAR analysis, which is that a MAR higher than 1 indicates that investors perceive excess return to be available from present or future regulatory settlement, which could take the form of expected outperformance or simply because the allowed return exceeds the actual cost of capital. Ofgem believes that this investor perception is then reflected in the market price of the firm over the RAV. Ofgem posits that if the price control is calibrated appropriately, MARs observed (in transactions) should be 1 (or close to 1).[4] Below we outline why this assumption is flawed and show that Ofgem's analysis based on this assumption reaches wrong conclusions.

2.1 Why we should not expect MAR to be 1

First of all, we recognise that it is not unreasonable for Ofgem to want to monitor the valuation levels of the regulated networks to understand how the sectors are perceived by the capital market. Valuation based cross-checks can provide some useful information on where the regulatory regime sits within the short-term market condition.

However, these cross-checks should be interpreted with care. Ofgem is wrong to simply build the analysis on a prior belief as to what the appropriate level of MAR should be and draw conclusions on the allowed return when we observe a MAR different from that prior belief. Specifically, Ofgem has formed a prior belief that if the regulatory price control is set such that allowance exactly equals to the costs (including the cost of capital), then the efficient notional company should have a MAR equal to 1. The logical extension of this is that a MAR higher than 1 implies a company which is expected by investors to outperform its regulatory assumption, either on cost and incentives or the allowed return is too high.

However, this belief – while plausible in theory – is not true in reality. Even if the regulator forecasts all aspects of the price control accurately (including totex) and all investors believe in expectation the outturn spend of regulated networks is equivalent to the expected spend

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[3] See for example the 2017 UKRN WACC report by Wright, Mason and Burns and various representations made by the appellants in the RIIO GD2/T2 CMA appeals.

[4] Ofgem (2020) RIIO-2 Draft Determinations – Finance Annex, para 3.79-3.85. CEPA (2020), RIIO-2: Use of Market Evidence, Section 2.1 and 2.2, relied on by Ofgem in the T2/GD2 Draft Determinations.

and there is no room for any outperformance, the following conditions need to be met for MAR to be equal to 1:

i. Markets are efficient. This means that there needs to be perfect information and transactions are frictionless.

ii. All investors are perfectly rational and have perfect foresight. They also all need to employ the identical fundamental valuation approach for equity assets.

These conditions clearly do not hold in reality. If they did, we would not observe unexplained stock market fluctuations, e.g. the phenomenon of bull markets and bear markets, driven by market sentiment and momentum. In other words, market valuation is influenced by factors which are unpredictable, not based on fundamental valuation models and certainly outside the regulators' control.

It is therefore problematic for regulators to interpret the MAR evidence in relation to a prior belief which is clearly not true in reality. Any conclusions drawn from such an exercise are likely to be highly speculative and misleading. More specifically, when we observe a MAR higher than 1, this does not necessarily mean that the stock is outperforming in the eyes of investors. In a bullish market, a MAR higher than 1 may be the expectation, or the stock may even be underperforming the market. One of the reasons for this to be pervasive is that bullish investors may believe that their assets can be sold at an equally (or even more) highly valued price later (high terminal value in a private transaction), which justifies the high price at present as long as the bullish sentiment is assumed to persist. Vice versa, in a bear market, a MAR lower than 1 may be expected, or the stock may even be out-performing. The only way to find out if a stock is out- or under-performing is to carry out a relative valuation exercise. We also note that this is a technique commonly employed by finance practitioners, alongside fundamental valuation techniques. We turn to this alternative valuation-based cross check below.

2.2   Ofgem should focus more on relative valuation

If Ofgem should not compare the MAR to 1, then what should it compare the MAR to? The answer is it can compare the valuation of the regulated utilities with the market and with relevant benchmark peers or indices.

We note that the MAR cannot be computed for non-regulated companies without a RAV. This makes comparing valuation levels of regulated utilities with the rest of the market on the basis of the MAR impossible. However, Ofgem can rely on other established valuation ratios which can be compared across.

Generally accepted valuation ratios such as the Price-to-Earnings (P/E) ratio as well as the Enterprise Value-to-EBITDA ratio, would do a reasonably good job in assessing whether regulated utilities outperform the rest of the market. This is in fact what equity analysts do on a daily basis when they issue guidance on buy and sell advices to investor clients. These

valuation metrics do not require a prior belief which hinges on unrealistic assumptions on market being perfect, as in the case of assuming MAR equals 1. We now turn to these in more detail.

The Price to Earnings (P/E) ratio is the stock price divided by the company's earnings per share for a designated period, generally the past 12 months. The Enterprise Value to Earnings Before Interest, Tax, Depreciation and Amortisation (EV/EBITDA) ratio is simply the quotient of the two, and the last 12 months of EBITDA is generally considered.

The P/E ratio is a widely used metric for considering the relative valuation of equity; and the EV/EBITDA can be considered a good supplementary metric to the P/E ratio as the EBITDA figure contains fewer accounting adjustments.

We can look at these ratios for regulated utilities and check against those of the rest of the market to check if:

■ regulated utilities' valuation ratios move in line with the market; and,
■ the magnitude of utilities' valuation ratios are in line with or lower than the rest of the market (e.g. median or average demonstrated by the market);

We note that our proposed analysis is not intended as a precise exercise: to do so, we would need to know with confidence the "right" level of valuation ratios for regulated utilities. However, we would expect regulated utilities to have valuation ratios which are in line with the market median/average or slightly lower, as they are generally considered to be "income stocks" and as such trade at lower valuation multiples than the market as a whole.

To do this, the first step is to construct the relevant dataset. Since our focus is to assess regulated utilities' market valuations relative to comparable companies and the broader market, we consider all companies in the FTSE100 over the last decade or so. In this context, the regulated utilities group consists of the five regulated utilities traded on the FTSE which are National Grid, Severn Trent, United Utilities, Pennon, and SSE. We consider FTSE100 firms suitable for the analysis, as regulated utilities have frequently been in the FTSE100 and this index contains a list of reputable firms with long histories which can be traced back for more than 10 years. An even wider market index such as FTSE All Share could also be used but would contain more "growth" stocks with higher valuation ration. We have therefore chosen the more conservative FTSE100.

We then compute the basic ratios. The P/E ratio is simply the stock price at the end of the financial year divided by the earnings per share accrued in that financial year; a similar calculation is conducted to derive the EV/EBITDA ratio.

We note that earnings data has been observed to be volatile. This is due to short-term fluctuations in company performance and/or sometimes company specific, one-off accounting

adjustments. Therefore, we consider the Cyclically Adjusted Price to Earnings ratio (CAPE),[5] which instead takes the average of the last 10 years of earnings instead of the earnings accrued in the last financial year, adjusted for inflation.[6] Many practitioners consider that using average earnings over the last decade helps to smooth out the impact of business cycles and other events, and gives a better picture of a company's sustainable earning power. In our case, this helps to provide a more stable and long-term view of whether utilities are over- or undervalued relative to the rest of the market. The same adjustment is applied to the EV/EBITDA ratio.

As a final step, we consider the position of regulated utilities relative to the rest of the market, with the mean, 25th, 50th and 75th percentile of the ratios observed in the wider market as guides.

2.3 Market evidence shows that regulated utilities are not relatively highly valued, contrary to Ofgem's conclusions from its MAR analysis

The figures below show the range (minimum and maximum) of the Cyclically Adjusted P/E and EV/EBITDA ratios on UK regulated networks. This is compared against the P25 and P75 (interquartile range) of the same ratios for other FTSE 100 companies over the same period.

Figure 1   CAPE and Cyclically Adjusted EV/EBITDA, UK networks vs P25, P50 and P75 of CAPE of other FTSE 100 companies
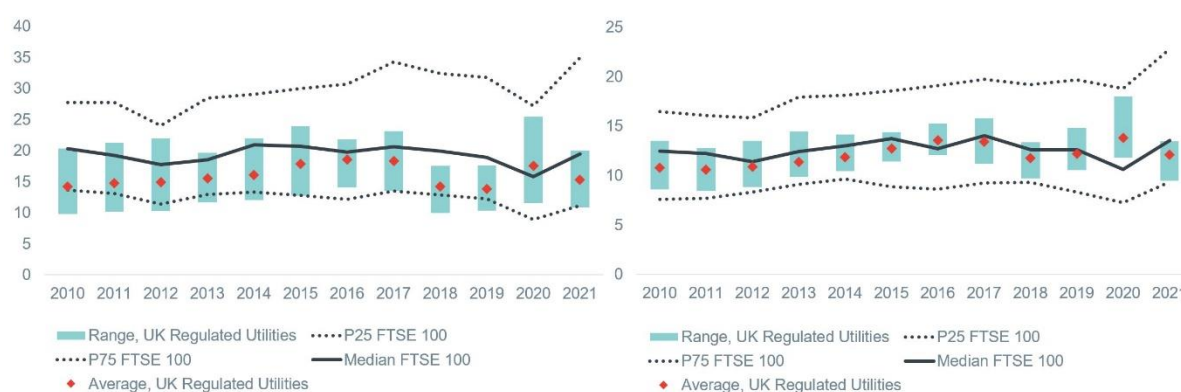
Source: Frontier Economics analysis of Bloomberg data

After adjusting for short-term noise in earnings, the range of UK Networks P/E ratios lie in the lower end of the P/E range demonstrated by FTSE 100 companies, i.e. between the P25 and the median. This is broadly true for both the P/E and EV/EBITDA ratio, although it is less

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[5]   The CAPE was introduced by Professor Robert Shiller in 1988. https://indices.barclays/IM/21/en/indices/static/shiller.app

[6]   As we are considering average earnings over a period of 10 years, we need to control for different price bases, and we do so by considering CPI inflation as the headline measure of inflation in the UK.

consistent for the latter. The mid-point of the EV/EBITDA ratio is systematically slightly less than the FTSE100 median and tracks the market trend very closely.

The above results show that the valuation of regulated utilities moves in line with wider market and sits where one would expect regulated utilities to sit within the wider market. There is no compelling evidence in this relative valuation analysis that suggests that regulated utilities are outperforming the rest of the market.

This is in contrast with the conclusion drawn from looking at MAR evidence where the prior belief is that MAR should be 1, where some higher MARs have been recently interpreted as an indication that the regulatory settlement may be too generous. This belief is dangerous as it leads to policy designs that aim to bring MAR towards 1, as that is deemed as the yardstick of a regulatory regime free of problems.

However, as the above analysis has shown, the MAR does not have to 1 for a regulated utility to be considered fairly valued, according to standard equity market valuation metrics. If policy objectives are aimed at achieving a MAR of 1 (or close to 1), Ofgem would face legitimacy challenges if and when high valuation conditions reverse. For example, when the economy is in a recession and MAR is lower than 1, through no fault of the price control settlement, these policies would imply the opposite results putting upward pressure on the implied cost of equity in an environment where Ofgem may find it less justifiable to increase the allowed returns.

This is the primary reason why we have serious concerns with the way Ofgem interprets its MAR analysis to inform its position on the allowed equity return.

# 3 Ofgem should consider the Dividend Growth Model cross check

In this section we discuss the Dividend Growth Model (DGM) and explain why it is a relevant cross-check of the cost of equity. We outline how Ofgem can employ the DGM cross-check for ED2, and we discuss the DGM evidence in relation to ED2. We have also included further details of our methodology which can be found in the Annex A.

3.1 Introduction to the DGM

The Dividend Growth Model (DGM) is a well-established, short-term market-implied, forward-looking methodology used for valuation assessment or to estimate the implied the cost of equity given market valuation.

The DGM is a model used to value a company's stock price. It is based on corporate finance theory: the stock price of a company is equal to the present value of the sum of all of its future dividend payments discounted by an appropriate rate. The rate used to discount is an estimate of the cost of equity for that company. If the stock price and future dividend payments are known, the DGM can be used to backward engineer the cost of equity. Figure 2 below presents a simple visual representation of the DGM.

Figure 2   Simple visual representation of the DGM
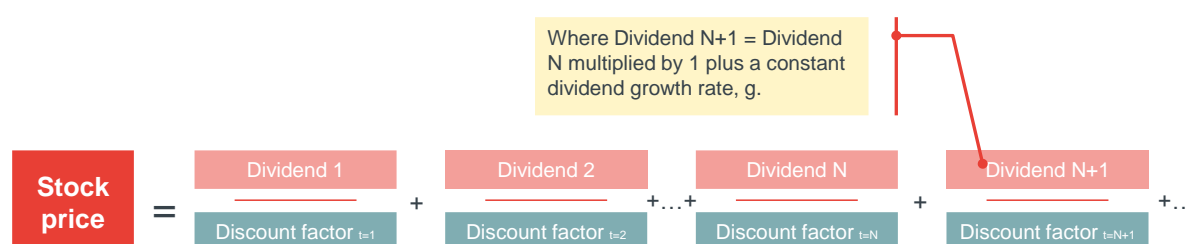
Source: Frontier Economics

3.2   Why the DGM is relevant as a cross-check

As a cross check based on short-term market-implied evidence, the DGM methodology provides a more reliable approach than other alternatives, including the MAR, for two reasons:

■ The DGM model is based on the well-established corporate finance principle that values stock at the present value of all its future discounted dividend payments (the Discounted Cash Flow or DCF model); instead, Ofgem's MAR relies on theoretical assumptions on dividend but not actual dividend payment either present or future, which is disconnected to the market price of the shares and hence yields misleading results.

■ The DGM model does not require any prior belief or assumption to be made on what an appropriate or target cost of equity should be. Instead, as explained above, the approach adopted by Ofgem and other regulators to use the MAR requires a prior judgement of what an appropriate MAR value should be.

As with all other cross-checks, the DGM has some drawbacks, which regulators have to be mindful of when interpreting the results derived from the DGM (as with all other COE cross-checks). These drawbacks can be addressed as indicated below.

■ **Circularity issue**. Relying on the DGM to set the allowed cost of equity would cause a circularity issue. The issue of circularity stems from the fact that:
  □ dividend forecasts depend on the expectations of future regulatory provisions, which are going to be decided by the regulator; and
  □ the dividend forecast can influence the regulatory determination if the DGM (which relies on dividend forecasts) is used to set the allowed cost of equity.

However, this circularity issue exists only if the DGM is used to set the allowance. We are not proposing to use the results of the DGM to set the cost of equity allowance, but only as a cross-check.

- **Sensitivity to long-term dividend growth.** The results of the DGM depend on the assumption around the long-term dividend growth. The sensitivity of the results can be addressed by considering a range of results estimated using a range of plausible assumptions about the long-term dividend growth.
- **Volatility of results.** The DGM provides a short term valuation metric, relying on share prices which can be volatile from one period to the next. DGM estimates can therefore move substantially within a short period of time. The same issue exists for all short-term market-implied cross-checks, including the MAR cross-check used by Ofgem. For this reason, consideration should be given to the volatility of the results when weighting the evidence from these types of cross-checks, which should not be used as a primary source of evidence to set the cost of equity allowance.

Therefore, the DGM should be added as part of the evidence base that is used to cross-check the cost of equity estimates. In contrast, Ofgem's refined MAR analysis makes an unsatisfactory attempt to reflect the expectations of future dividend, but still operates in the hypotheticals of the regulatory construct and therefore is not reconcilable to market share prices.

3.3   Proposed approach to conducting the DGM analysis

We propose using the DGM methodology to derive a range of plausible COE. Consistent with Ofgem's approach, we have estimated the implied cost of equity for the 5 UK regulated network companies that are listed.

We consider a two stage DGM, which assumes that dividends grow at different rates over two periods:

- Stage 1: Dividend payments for the years 2023-2025.
- Stage 2: Dividends for 2026 onwards. The DGM results are primarily driven by this stage of the model.[7]

The dividend payments in Stage 1 of the model are based on the companies' stated dividend policies, according to their recent annual reports. These are summarised in the figure below.

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[7] For example, the present value of the dividends cash flow over Stage 2 account for approximately 86% - 92% of the present value of all dividend cash flows across Stage 1 and Stage 2, depending on the company and long-term growth scenario considered.

Figure 3   Stage 1 assumptions, Latest dividend policies by company

COMPANY	DIVIDEND POLICY
United Utilities	Annual growth rate of CPIH
Severn Trent	Annual growth rate of CPIH
Pennon Group	Annual growth rate of CPIH + 2%
National Grid	Annual growth rate of CPIH
SSE	Annual growth rate of RPI up to FY 2023/24, re-basing at 60p in FY 23/24 then annual increases of 5%

The dividend payments in Stage 2 of the model are derived by increasing the 2025 dividend forecast from Stage 1 by a long-term real dividend growth rate assumption.

Long-term dividend growth forecasts are less certain; as such, we have considered three growth scenarios for each company, summarised in the table below. This mitigates the risk that conclusions are driven by a particular growth scenario assumed.

Figure 4   Stage 2 assumptions, long term dividend growth rate

SCENARIO	REAL LONG TERM DIVIDEND GROWTH RATE	DESCRIPTION
Low	0%	Dividends are assumed to be constant in real terms at 2021 levels, i.e. no real growth in the long term.
Base	0.69%	Dividends are assumed to grow at UK long term real dividend growth rate, averaged over 1900-2021. (*Source: DMS 2022 Yearbook*)
High	1.65%	Dividends are assumed to grow at a real rate equal to the OBR's forecast of real GDP growth in 2026.

The low scenario assumes no real dividend growth over the long-term. We consider this scenario a rather conservative scenario, as two of the five regulated utilities expect to have a positive real dividend growth to 2025, and the UK long-term real dividend growth is 0.69%.

A full discussion of the DGM analysis and forecasts that we have used, together with detailed findings can be found in the technical annex.

3.4 DGM evidence implies that the COE is likely higher than 4.75%

Figure 5 below presents the implied real cost of equity from the DGM cross-check for the 5 companies under consideration. The values are averages of the cost of equity derived for each working day over the period April 2022 – June 2022. To facilitate comparison with Ofgem's CAPM COE estimate which is estimated using notional gearing of 60%, we estimated the cost of equity for a notional company with 60% gearing. We used the same risk free rate proposed by Ofgem and assumed a debt beta of zero.

Figure 5   **Implied CPIH-real COE ranges from the DGM cross-check**

COMPANY	LOW CASE SCENARIO	BASE CASE SCENARIO	HIGH CASE SCENARIO
Pennon Group	4.6%	5.4%	6.5%
Severn Trent	5.1%	5.9%	7.1%
United Utilities	5.2%	6.0%	7.0%
National Grid	5.7%	6.5%	7.5%
SSE	6.8%	7.9%	9.4%
Range	**4.6% to 6.8%**	**5.4% to 7.9%**	**6.5% to 9.4%**

Source: *Frontier Economics*

Note: *Figures are in CPIH-real terms*

The cross-check indicates that the cost of equity is higher, across all scenarios but one, than Ofgem's proposed cost of equity of 4.75%. In the most conservative scenario considered, which assumes no real dividend growth in the future, the evidence suggests an implied cost of equity of **between 4.6%-6.8%,** with a **mid-point of 5.7%.**

In the ED2 DD, Ofgem states that its Step 1 range is not too low, by suggesting that "*Cross-checks provide greater support for the lower half of the CAPM-implied range from Step 1*".[8] However, the results of the DGM cross-check supports a much higher range than the range considered by Ofgem.

The DGM analysis also shows that the cost of equity for the energy companies is higher than that of water companies. This is in line with our expectations, given that the energy networks' systematic risk exposure is higher than that of water companies due to the structural changes that the energy networks will face in the near future.

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[8]   Ofgem (2022) RIIO-ED2 Draft Determinations – Finance Annex, para 3.82-3.83

To further enhance the robustness of conclusions we can draw from this cross-check, we have further considered evidence from a European peer group, based on the same comparator set recommended by various expert advisors in the RIIO GD2/T2 CMA appeals.[9] We apply the same approach as with UK companies i.e. a 2-stage approach and a range of assumptions to account for the volatility in DGM estimates. The companies' dividend policies for Stage 1 of the model are presented in **Figure 6**, **Figure 6   Dividend policies for the European peer group** and the range of assumptions for Stage 2 of the model are set out in detail in Annex A.

Figure 6   Dividend policies for the European peer group

COMPANY	DIVIDEND POLICY
Red Electrica	€0.80 dividend per share floor from 2023-2025.
Enagas	€1.72 dividend per share to 2022 and €1.74 dividend per share 2023-2025.
Terna	For 2022 and 2023, the dividend will be at the 2021 level uplifted using the CAGR (compound annual growth rate) of 8%. For 2024 and 2025, the dividend will be at least the 2023 level, or meet a 75% pay-out ratio.
SNAM	2.5% annual growth 2023-2025.

Source: Companies' annual reports.
Red Electrica -
https://www.ree.es/sites/default/files/06_ACCIONISTAS/Documentos/Hechos_relevantes/2021/24022021_HR_Progress_Strate gic_Plan.pdf
Enagas - https://ww.enagas.es/content/dam/enagas/en/files/enagas-communication-room/publications/informe-anual/ANNUAL%20REPORT%202021_ENAGAS.pdf
Terna - https://www.terna.it/en/media/press-releases/detail/update-2021-2025-industrial-plan-driving-energy
SNAM - https://www.snam.it/export/sites/snam-rp/repository/file/investor_relations/presentazioni/2021/2021_2025_Strategic_Plan.pdf

Note: For Red Electrica and Terna, we have assumed the dividends will be in line with the dividend floors as specified in their dividend policies because: i) in the case of Red Electrica, the dividend policy only specifies the floor and not the target, and ii) in the case of Terna, whilst the dividend target is specified to be a 75% pay-out ratio, Terna's future profits (necessary for calculating the pay-out ratio) are uncertain. Therefore, the dividend payments may be higher than the floor, and as such, our dividend estimates, and therefore COE cross-check estimates, will be conservative.

Similarly to the UK companies, even in the most conservative scenario considered, the results of the cross-check on the European peer group support a range which is higher than the range considered by Ofgem.

As shown in the figure below, the European peer group supports a CPIH-real COE range of 6.7%-10.6% in the base scenario.

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[9]   Oxera, The Cost of Equity for RIIO-2 (page 42). https://www.oxera.com/wp-content/uploads/2018/07/ENA-cost-of-equity_2018-02-28.pdf.pdf

Figure 7   Implied CPIH-real COE ranges for the European peer group

COMPANY	LOW CASE SCENARIO	BASE CASE SCENARIO	HIGH CASE SCENARIO
Red Electrica	6.7%	6.7%	9.2%
Enagas	10.6%	10.6%	12.7%
Terna	3.3%	5.9%	7.1%
SNAM	4.9%	7.1%	8.1%
Range	**3.3% to 10.6%**	**6.7% to 10.6%**	**7.1% to 12.7%**

Source: Frontier Economics

Note: Figures are in CPIH-real terms.
The low scenario for the European peer group reflect a long term real dividend growth rate of 0% for the Spanish companies (Red Electrica and Enagas) and -1.76% for the Italian companies (Terna and SNAM), sourced from the Credit Suisse 2022 DMS Yearbook. The base scenario reflects no real long term dividend growth, and the high scenario reflects real dividend growth in line with the real GDP growth of the country.

3.5   Implied long-term dividend growth rate consistent with Ofgem's proposed cost of equity

To further assess the reasonableness of Ofgem's proposed cost of equity, we have used the DGM model to calculate the implied long-term real dividend growth required for the estimated real cost of equity to be 4.75%.

Figure 8 below presents our findings. The table shows that according to the DGM model the long-term real dividend growth consistent with Ofgem's 4.75% is a **negative real growth** for four out of the five companies considered, of between -0.29% and -1.29%. It would imply a decrease in the RCV or operating profit of the companies in the long term. This is implausible given the expectation of future capital expenditure expected in the water and energy network sectors in the future. The figure below sets out the implied dividend growth for each of the comparators to imply a CoE of 4.75%.[10]

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[10]   Ofgem (2022) RIIO-ED2 Draft Determinations – Finance Annex, Table 19

Figure 8   Implied long-term real dividend growth required for DGM real COE to be equal to 4.75%

COMPANY	IMPLIED LONG-TERM REAL DIVIDEND GROWTH
Pennon Group	0.10%
Severn Trent	-0.88%
United Utilities	-0.43%
National Grid	-1.29%
SSE	-0.29%
Range	**0.10%- (-)1.29%**

Source: Frontier Economics

The DGM evidence shown above is in stark contrast to the conclusion Ofgem is drawing from all of its chosen cross checks with which it that its cross-checks provide "confidence" that the CAPM results are "not too low".[11] From this DGM analysis, based on the current market conditions, the cost of equity of 4.75% suggested by Ofgem could indeed be too low. We recognise that past DGM analysis carried out by Ofgem's advisors may have inferred lower cost of equity before, which in our view reinforces the short-term variability of such analysis.

4   Ofgem should consider a long-term profitability cross-check

While we consider that the DGM methodology has value as a cross-check, it still suffers from the same short-term market valuation based characteristics, much like the MAR and other alternative valuation metrics we proposed such as CAPE and EV/EBITDA. In our view, if the purpose of the cross checks is for the regulator to take "a step back" and assess whether its CAPM estimates of the COE makes sense by triangulating other sources of information, then it would be reasonable to look into the profitability that is achieved by companies in comparator companies and wider market as a whole.

Accounting profitability metrics such as Return on Equity (post-tax profit expressed as a percentage of equity) in recent history can be informative about the level of profitability that a listed company has achieved and can be expected by the market to achieve. Given that profitability varies year-to-year due to, among other causes, the business cycle, profitability metrics are a useful cross-check when considered over the long-term (i.e. over one or more business cycles).

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[11]   Ofgem (2022) RIIO-ED2 Draft Determinations – Finance Annex, para 3.84

4.1   Why Ofgem should consider long-term profitability

There is a good reason why the long-term profitability of companies in the market provides a valuable cross-check for CAPM COE estimates. Ofgem does not set the outturn total return that shareholders realise from holding an equity stake in a regulated business. A shareholder's outturn total return depends on:

- the average price for which shares were bought;

- the average price for which shares were sold; and

- the dividends paid while the shares were owned.

The first two elements depend on the valuation of the regulated business. Ofgem's regulatory decision will influence valuation to degree, but wider capital market conditions, over which Ofgem has no control, will also exert considerable influence. It is important for Ofgem to remember that its task is to set an appropriate profitability for the regulated companies, instead of calibrating the price control to deliver certain levels of investor valuation (which is the primary concern of short-term valuation based cross-checks such as MAR).

Out of the three elements listed above, Ofgem only has a strong influence over third element. This is because Ofgem is effectively setting the allowed level of profitability when it sets the cost of equity allowance. Assuming companies achieve the level of efficiency expected by Ofgem on all fronts of the price control, the cost of equity allowance implies a specific outturn return on equity (i.e. profitability).

Ofgem should assess how the proposed level of allowed equity returns compares to the outturn level of profitability for comparable businesses (i.e. businesses with a similar aggregate risk profile as energy networks). This cross check therefore provides a useful real-world check on whether or not the allowed return for the regulated companies are reasonable (or potentially too high or too low).

There are limitations to the analysis based on profitability metrics, such as the effect of financial leverage is not considered, and the question of comparability of the benchmarks. Attempting to correct for these limitations would bring the analysis back into the realm of CAPM, which would defy the point of the cross check. It is therefore important to keep this cross check (like for all cross checks in our view) at a high level and only use it to inform whether or not the CAPM range is broadly in line with reality.

4.2   Approach, methodology and assumptions involved in deploying long-term profitability metrics as a cross-check

The long-term profitability cross-check is straightforward to implement. There are three relevant considerations before implementing the cross-check:

- we choose a measure of profitability
- identify any necessary adjustment to ensure relative comparability of that measure of profitability with Ofgem's cost of equity allowance; and
- identify a suitable set of comparator businesses.

We have implemented the cross-check by using the return on common equity (as reported by Bloomberg). This is a post-tax, nominal measure of profitability, derived from statutory financial statements. It is uncontroversial and transparent.

Return on common equity is similar to Ofgem's cost of equity allowance in the sense that both are post-tax metrics. We recognise that the regulated equity is distinct from the book value equity in statutory balance sheet, and so comparing the cost of regulatory equity with the return on equity of benchmarks measured by book value is not strictly speaking like for like. However, we do not consider this discrepancy invalidates the cross-check, if we are prepared to accept that no cross check is perfect.

For the cross-check to be useful, we must consider long-term profitability for a suitable set of comparator companies. According to the fundamentals of finance theory, companies with similar systematic risk profiles should have similar expected returns. We therefore look at the return on common equity for utility sector indices and a set of four EU and six US comparator utilities.[12]

We calculate the (arithmetic) mean return on common equity for these utilities and indices over a period of up-to 20 year (2002 to 2021), to the extent the requisite annual data is available from Bloomberg. We present the minimum, maximum and median returns for the various 2002 to 2021 average returns. To provide further context, we also present the trends in profitability.

4.3   Long-term profitability in real terms has not decreased with interest rate and is higher than 4.75%

Figure 9 shows the trend in (nominal) return on common equity for UK, European and US utility sector indices, between 2002 and 2021. The figure shows volatility in profitability year-on-year (particularly for the UK). Absent from the figure is a clear historic trend in profitability. This is an important insight and reveals that the accounting profitability of listed utility businesses has not trended downwards to a significant degree.

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[12] The utilities sector indices we consult are: S&P 500 Utility Index; FTSE All Share Utility Index, and the Eurostoxx 600 Utility Index. The four EU comparator utilities are: Red Electrica Corp SA; Enagas SA; Terna – Rete Elettrica Nazionale, and Snam SpA. The six US comparator utilities are: Duke Energy Florida LLC; Florida Power & Light Co; Gulf Power Co; Tampa Electric Co, and Georgia Power Co.

Figure 9   Trends in nominal return on common equity for UK, European and US Utility indices
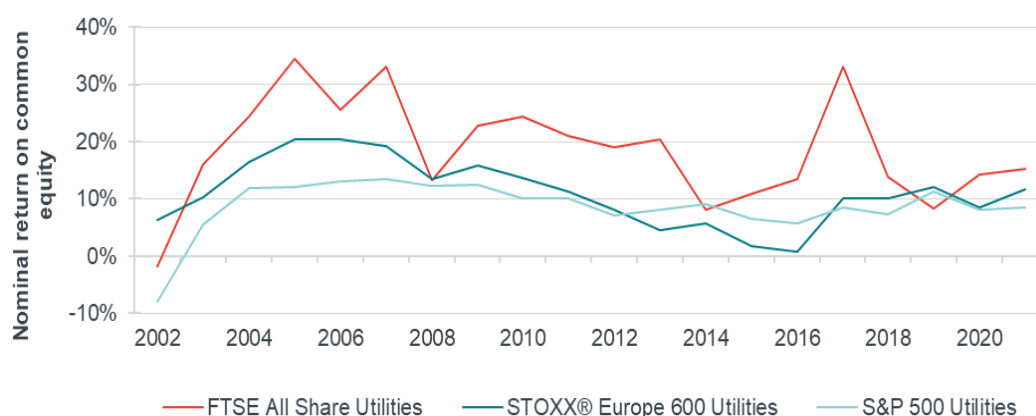
We can also show that the lack of a trend in long-term profitability is not confined to the utilities sector. The red line in Figure 10 shows (nominal) return on common equity for the FTSE All Share Index between 2002 and 2022. The green line show the nominal return on 10-year UK Gilts (i.e. a proxy for the risk-free rate). The dashed lines show the linear trends for the respective return.

Figure 10   Trend in nominal return on common equity for FTSE All share Index and 10-year UK Gilts
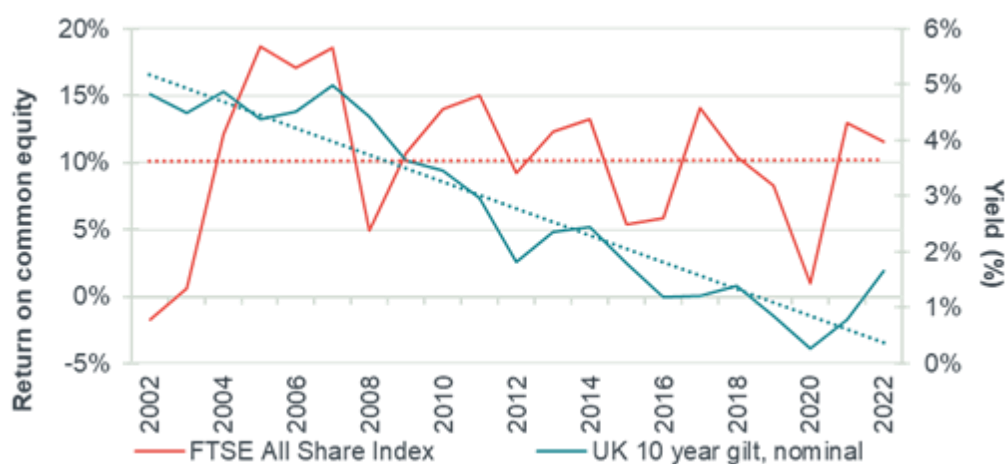
What these figures show is the disconnection between the so-called "lower-for-longer" interest rate environment and the belief that all assets should therefore require lower returns versus the actual profitability that businesses have been able to make within this environment. It casts

doubt on regulators' position that they should set the allowed returns (profitability) of the regulated utilities firmly in line with capital market conditions

To attract and retain capital, regulated businesses should have the opportunity to generate profits similar to comparable businesses (in terms of risk). Therefore, in addition to the market-wide indices shown in the chart above, we have identified a number of comparable sectors as well as individual utilities that can be considered to operate in similar sectors as the UK utilities. The benchmark includes UK, EU and US utility indices, four European regulated energy network utilities and five US regulated energy network utilities. Given that Ofgem's cost of equity allowance effectively sets the allowed level of profitability, the cost of equity allowance should be broadly in line with observed average levels of profitability in the long-term.

The table below shows the smallest, largest and median CPI-real return on common equity achieved by comparable investment opportunities averaged over 2002 to 2021 (nominal returns are converted to real terms using outturn CPI inflation figures). The cost of equity allowance range implied by the cross check spans larger values than implied by Ofgem's primary methodology, CAPM.

Figure 11   Real return on common equity for comparable sector indices and comparable utilities in EU and US

	AVERAGE 2002 - 2021
Low	6.4%
Median	9.3%
High	19.3%

Source: Frontier Economics analysis of Bloomberg data. Comparators include the Utility indices from FTSE, S&P and Eurostoxx. Utilities include four EU regulated energy network utilities and five US regulated energy network utilities.

Notwithstanding the potential difference in gearing levels of these benchmark companies and the difference between regulated equity and book value equity, these figures show that the allowed return of 4.75% proposed by Ofgem for ED2 can safely be regarded as not too high. This is in contrast with Ofgem's proposed set of cross checks, which all seem to suggest that the COE in real life must be lower.

A key point to remind ourselves of is the fact that the regulator does not set the return for the asset owners, instead it sets the profitability for the business. There is no guarantee that these two need to converge, as suggested by theory.

For the avoidance of doubt, we are not suggesting that the allowed return should be set at the profitability levels observed in benchmark companies, indices, or the wider market. The added value of looking into these profitability metrics is to provide a real-life cross check for the regulators to consider whether or not the allowed return determined by its primary method, the

CAPM, is broadly in line with the real world. In that sense, this is a valuable cross check to be added into the range of cross checks.

5 How to interpret the cross checks

No cross-check is perfectly robust or reliable, which is why they are not considered a replacement for CAPM as the primary estimation method of the cost of equity. All cross-checks will display some undesirable properties that markedly weaken their reliability.

Ofgem's MAR cross check relies on short-term or market-implied evidence. Greater reliance on such cross-checks to determine allowed equity returns will therefore lead to a breakdown of the long-standing consensus (endorsed by the UKRN paper) that cost of equity should be set by reference to long run evidence.

Use of short run measures would wash a combination of "market sentiment" and "noise" into the regulatory determinations, weakening stability and predictability and harming investor confidence. All of these measures would introduce a new form of pro-cyclicality into regulatory determinations, which runs counter to the original intention of the RAV-based model.

■ Allowed cost of equity would vary with short run market sentiment, which could lead to greater systematic risk in utility stocks.
■ This in turn could increase beta over time to the detriment of customers.

Reliance on cross-checks introduces a new form of regulatory discretion into determinations, i.e. how to interpret noisy, volatile and potentially contradictory cross-check evidence.

■ This in and of itself would dent investor confidence and make the sector less attractive for investors. This is particularly critical at the current juncture of the UK's decarbonisation journey.
■ And it is unclear if regulators would use cross-checks symmetrically and would draw on them to *increase* the cost of equity. This is made clear by the fact that all of Ofgem's chosen cross checks suggest lower implied COE than its CAPM estimates, whilst one does not need to look far to see reasonable alternative cross checks (such as DGM and long-term profitability) to find the opposite results. Over time this would lead to censored and asymmetric outcomes.

For all these reasons, UK regulators have always consciously avoided using such short-term market-implied evidence to set the allowed equity return. We therefore recommend Ofgem to put less weight on short-term valuation based cross checks such as MAR analysis.

As explained in this paper, it is important for Ofgem not to lose sight of the actual purpose of the COE estimation, which is to set an appropriate profitability for the regulated companies. This is *not* synonymous with calibrating the price control to deliver certain levels of investor valuation (which is the primary concern of the MAR cross-check). Ofgem cannot control the

valuation levels of the regulated utility companies in reality, no matter how hard it tries, because markets do not always price assets at its fundamental value. If policy objectives are aimed at achieving certain pre-conceived theoretical valuation levels, Ofgem would face legitimacy challenges if and when high valuation conditions reverse. For example, when the economy is in a recession and MAR is lower than 1, through no fault of the price control settlement, these policies would imply the opposite results putting upward pressure on the implied cost of equity in an environment where Ofgem may find it less justifiable to increase the allowed returns above values suggested by long-term methods such as CAPM.

In that regard, we recommend that Ofgem adds our long-term profitability cross-check into its set of cross checks, as this is more in line with the actual purpose of the COE estimate: setting profitability levels for regulated networks.

Annex A - DGM technical Annex

In this section, we provide details of the methodology and assumptions we have used to derive our cost of equity figures during DGM. We then present detailed findings.

Estimation of raw cost of equity

We used a two-stage DGM approach to estimate a raw cost of equity. A two-stage DGM approach assumes that dividends grow at different rates over two periods:

- Stage 1. Dividend payments from financial year 2023 to financial year 2025.
- Stage 2. Dividend payments from financial year 2026 onwards.

Our DGM model equates the stock price to the present value of the dividends paid over these two periods. The companies in our sample pay both an interim dividend and a final dividend, so Stage 1 of our DGM model distinguishes between these two types of dividends.

In formula, our DGM model can be specified as follows:

$$P_t = \sum_{i=2023}^{2025} \left(\frac{DPS_i^{interim}}{(1+r_t)^{d_{i,t}^{interim}}} + \frac{DPS_i^{final}}{(1+r_t)^{d_{i,t}^{final}}} \right) + \left(\frac{DPS_{2025}\,(1+g)}{r_t - g} \right) \left(\frac{1}{1+r_t} \right)^{d_{2025,t}^{final}+1}$$

Where:
- P_t is the stock price at time t.
- i is the year starting on 1 July of calendar year $i - 1$ and ending on 30 June of calendar year i.
- $DPS_i^{interim}$ is the forecast of the interim dividend per share for year i expressed in prices at time t. For example, $DPS_{2023}^{interim}$ is the forecast of the interim dividend per share paid in year 2023.
- DPS_i^{final} is the forecast of the final dividend per share for year i expressed in prices at time t. For example, DPS_{2023}^{final} is the forecast of the final dividend per share paid in year 2023.
- DPS_{2025} is the forecast of dividend per share over year 2025, expressed in prices at time t. It is the sum of the interim dividend per share and final dividend per share over year 2025.
- $d_{i,t}^{interim}$ is the distance in years between the date when the interim dividend is paid and t.
- $d_{i,t}^{final}$ is the distance in years between the date when the final dividend is paid and t.
- g is the real growth rate in dividends from financial year 2026 onwards. We have assumed that these dividends are paid one year after the previous dividend is paid.
- r_t is the implied raw cost of equity in real terms.

We calculated the raw cost of equity in real terms. To do so, we expressed the dividend forecasts in prices at time t. We have done so by deflating the dividend forecasts by the expected inflation between t and the day when the dividend is forecast to be paid. Expected inflation is based on CPI inflation forecasts from the Office for Budget Responsibility (OBR).[13]

Estimation of the re-geared cost of equity

After having estimated the implied cost of equity r_t, we calculated a re-geared cost of equity r_t^* using the CAPM methodology with the Harris-Pringle equation (but assuming a debt beta of 0 for simplicity). In formula:

$$r_t^* = RFR + \frac{(1 - g_t)}{(1 - g^*)} \cdot (r_t - RFR)$$

To facilitate comparison with Ofgem's proposed cost of equity, we have used the same parameters and approach set by Ofgem:

- RFR is Ofgem's estimate of risk-free rate of -1.58%.
- g_t is the gearing at time t calculated using Ofgem's methodology. This has been calculated as the ratio between the company's net debt and the sum of the net debt and the market cap using data from Bloomberg.
- g^* is Ofgem's notional gearing estimate of 60%.

Finally, we have averaged our estimate of re-geared cost of equity r_t^* over the period from 1 April 2022 to 30 June 2022. This mitigates the impact that volatility in share prices might have on the cost of equity.

Long-term dividend and forecast scenarios

We acknowledge that no dividend growth scenario will perfectly reflect the situation of the companies considered. Therefore, to mitigate the risk that the conclusions of our analysis are driven by a particular assumption around the forecast of the long-term growth in real dividends, we used three different growth scenarios where the long-term growth varies between 0% and 1.65%. We describe these three scenarios below.

Base Case

In our base case scenario, the long-term real dividend growth is assumed to be equal to average real dividend growth observed historically in the UK over the past 122 years (from

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[13] Annual CPI forecasts are sourced from the OBR's official forecast database, available at https://obr.uk/data/. We used the OBR's CPI forecasts published in March 2022.

1900 to 2021). This is 0.69% per year. We sourced the long-term real dividend growth over this period from the Credit Suisse Global Investment Returns Yearbook 2022.

Low Case

All dividend forecasts from financial year 2026 are assumed to be constant in CPIH-real terms and equal to the 2025 dividend, i.e. no real growth in the long term.

This scenario reflects a conservative view of the growth in the forecast with respect to the companies' dividend policies, as the companies target dividends equal to or greater than inflation (as detailed in Figure 16):

- United Utilities, Severn Trent and National Grid target no real growth in the long term;
- Pennon target real growth of 2% (i.e. the dividend policy is CPIH +2%)
- SSE target a nominal growth annual growth of 5%, which is equivalent to approximately 3.4% real growth per year (if inflation is expected to be in line with the OBR's 5-year forecast of 2%).

High Case

Long term dividends are assumed to grow at a real rate equal to the latest OBR's forecast of real GDP growth in 2026. The latest OBR forecast at the time of writing was published in March 2022 and indicates that GDP is expected to grow by 1.65% in real terms in 2026. The rationale underpinning this this assumption is that as the economy grows, the companies are expected to grow as well.

Estimates of cost of equity

The charts below shows our estimates of the re-geared cost of equity for the 5 companies and the three scenarios considered over the period April 2022 to June 2022. The figures presented are in CPIH-real terms.

As can be seen from the charts the estimates vary slightly over time, due to volatility in stock prices. To mitigate the impact of this volatility, we have averaged these estimates over this period.
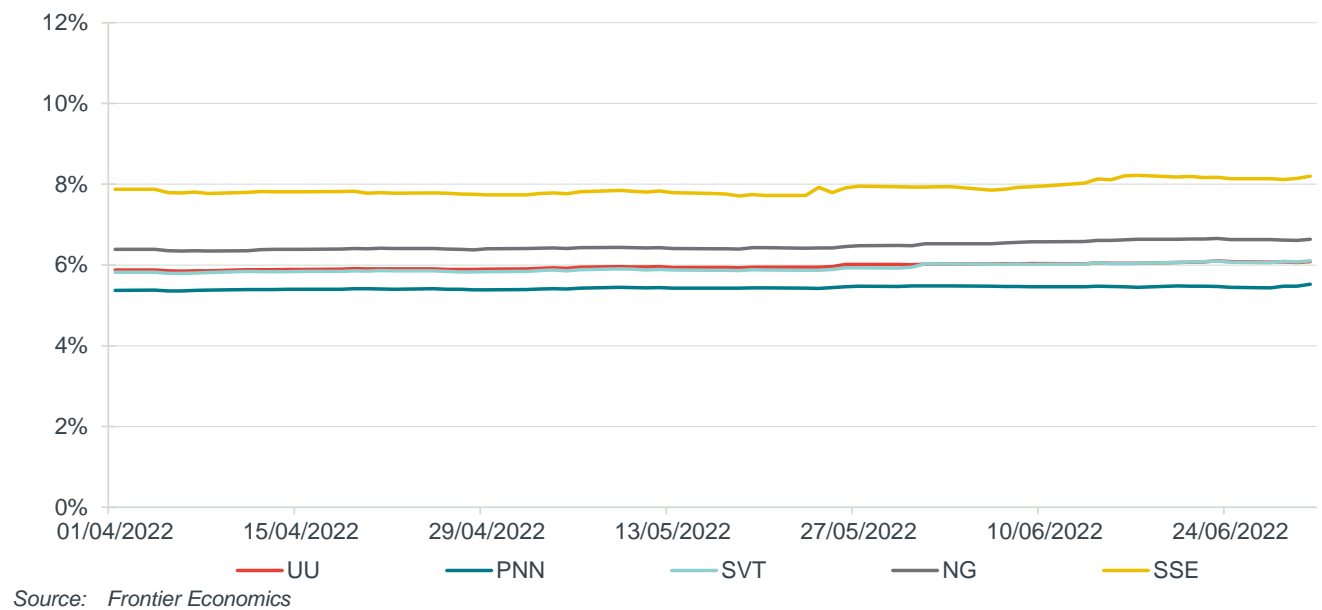
Figure 12   Base case DGM implied CPIH-real COE

Source: *Frontier Economics*

Figure 13   Low case DGM implied CPIH-real COE

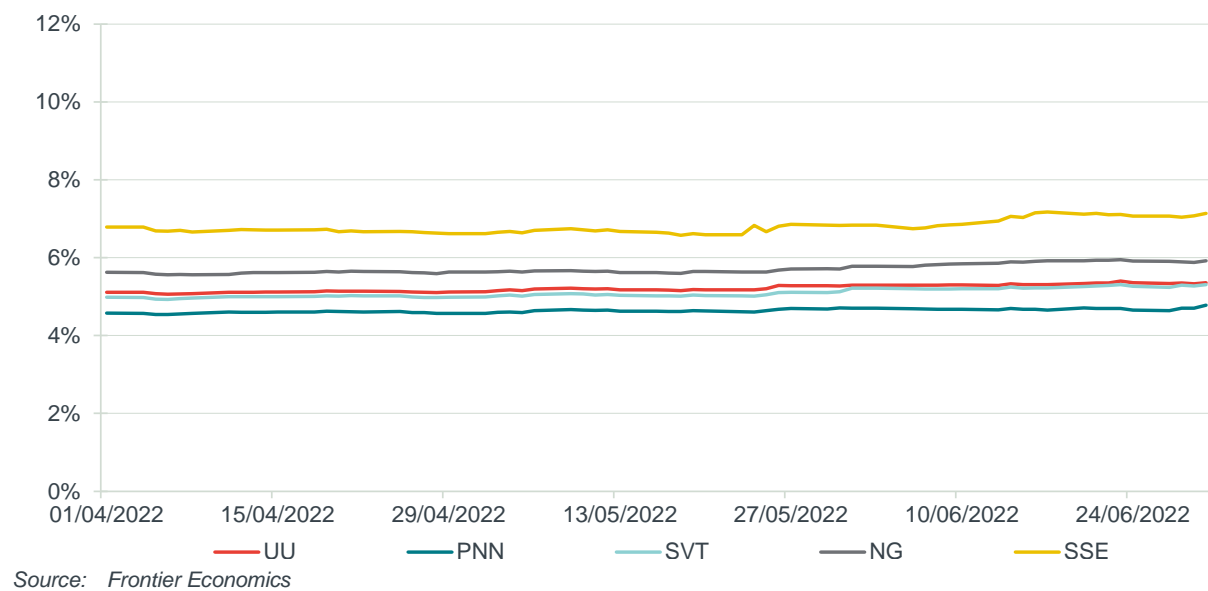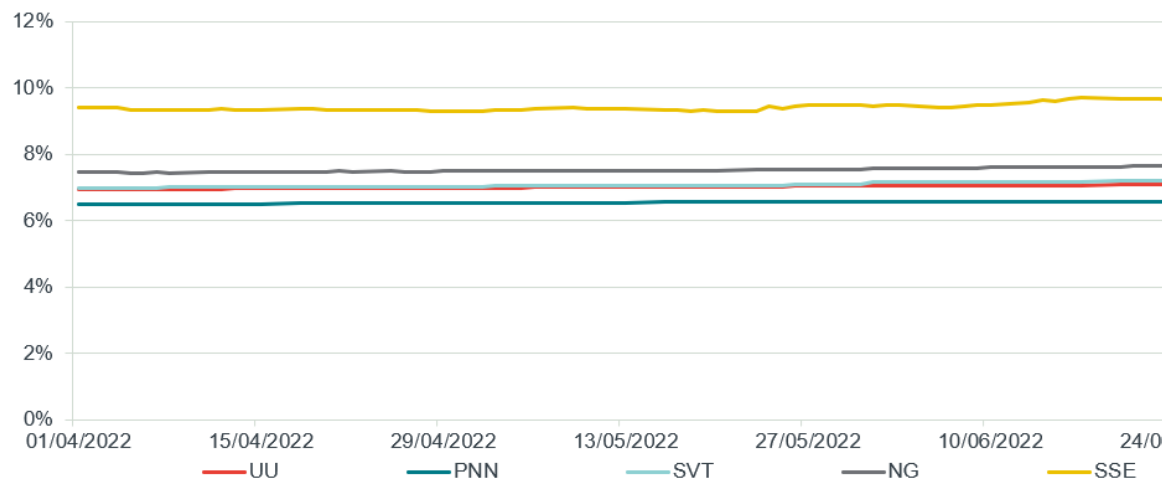Source: *Frontier Economics*

Figure 14   High case DGM implied CPIH-real COE

Source: Frontier Economics