RIIO-2: Cost of capital

A Report for Citizens Advice

HMK Advisory Ltd

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1 Summary

1.1 Background

- HMK Advisory has been engaged by Citizens Advice to review Ofgem's proposals for the allowed rate of return to be included in the RIIO-2 price control as set out in its Decision of 24 May 2019.

1.2 Ofgem's overall approach to determining the cost of equity (section 2)

- Ofgem's statutory principle objective is to protect consumers' interests. Ensuring that consumers do not pay unnecessarily high prices for energy is critical to achieving this objective.
- However, actual returns to regulated energy network company shareholders have been persistently much higher than those allowed for by Ofgem when setting prices - in total by £5.5bn over the RIIO-1 price control period.
- As noted in a recent report by the National Audit Office:

  "Under Ofgem's current regulatory framework, electricity network companies have provided a good service, but it has cost consumers more than it should have"

- Ofgem's current RIIO-2 proposals for calculating the allowed return go some way to addressing this problem. In particular, the introduction of an adjustment for expected outperformance represents a major improvement in price control design.

1.3 Actual market forecasts vs Ofgem's forecast (section 3)

- Ofgem's allowed returns are based on calculations requiring a measure of investors expected total market returns ('TMR').
- The practical difficulties of obtaining a robust view of current investor expectations has meant that regulators have historically used a proxy for actual investor expectations in calculating the allowed return – their own forecasts of future returns based on historical long-term average market returns.
- However, there is significant evidence that current actual investor expectations of future returns are below those earned historically. Ofgem's proposed TMR range of 6.25% - 6.75% CPIH real based on historical returns is materially higher than our updated assessment of investment manager's actual returns of 4.2% CPIH real.
- If Ofgem fails to reflect the difference in current actual TMR forecasts and historical TMR, it will gift shareholders an unnecessarily high return. Ofgem should therefore update its assessment of investment managers' forecasts of TMR at the determination stages and if, as is currently the case, actual market forecasts for TMR are below Ofgem's own forecasts based on historical returns it should use an average of the available actual market forecasts.

1.4 Ofgem's other cross checks for the cost of equity (section 4)

- We consider that Ofgem's cross-check of the TMR using the Dividend Growth Model ('DGM') fails to take account of plausible alternative model specifications. Ofgem's stated cross-check is based on a growth assumption equal to GDP growth – an assumption

which the Competition Commission has criticised as "*essentially arbitrary*". An alternative, and arguably preferable, assumption based on historical dividend growth, gives a TMR forecast below Ofgem's stated range based on historical returns. It is therefore incorrect to conclude that the DGM cross-check supports Ofgem's adopted range.

- Ofgem's use of required returns in OFTO bids as a cross-check needs to reflect the fact that the bids are more than a year old and that expected market returns have fallen since then.
- It is not clear how Ofgem have used their data on infrastructure funds' discount rates as a cross-check, but in our view, an understanding of the relative betas of the funds is needed before they can be used as a cross-check of either TMR or the cost of equity estimates.

1.5 Equity Beta (section 5)

- Ofgem's calculation of the equity beta for a notional network company is based on a sample of only five companies – only two of which have regulated energy network businesses (SSE and National Grid).
- Ofgem should therefore look for alternative measures of the risks of regulated wholesale energy networks. Suitable measures of regulated energy market risk may be available in the US where there are large numbers of quoted regulated utility companies. Most recent data for 16 US utility companies suggests asset betas of 0.27; significantly below Ofgem's proposed range of 0.35 - 0.40.
- Whilst the differences in market structures and other factors makes direct comparisons difficult, the lack of robust data in the UK means that Ofgem should do more work to understand the reasons for the difference in UK and US betas and whether US data implies Ofgem has overstated the beta used in its calculation of the cost of equity.

1.6 Adjustment for Expected Outperformance (section 6)

- The high levels of returns earned by regulated energy companies in the past reflect structural problems in the approach to designing price controls.
- Over the RIIO-1 price control period, regulated network operators are expected to outperform the allowed level of return by £5.5bn at the expense of consumers.
- Ofgem's proposals to make an adjustment to the CAPM derived cost of capital to allow for the difference between allowed return and expected return are a welcome improvement in price control design, but they do not go far enough.
- Firstly, Ofgem' working assumption of the level of the difference between allowed and expected returns, 0.5%, understates significantly the evidence on historical out-performance (2% - 3%).
- Secondly, Ofgem's approach as set out in its May 2019 decision to limit the impact of any adjustment for outperformance such that the allowed rate of return remains within its CAPM calculated range irrespective of the assumed level of outperformance risks over-rewarding shareholders
- Ofgem should consider formalising the adjustment for expected outperformance based

on historical levels – we suggest an adjustment equivalent to 50% of outperformance in the previous price control to ensure allowed returns do not fall below the minimum necessary level of return as a result of this proposed adjustment and to ensure incentive effects are not weakened.

2 Ofgem's overall approach to determining the cost of equity

2.1 Summary

- Ofgem's statutory principle objective is to protect consumers' interests. Security of supply and ensuring that consumers do not pay unnecessarily high prices for energy are the most important practical aspects of this objective.
- To ensure consumers do not pay unnecessarily high prices, price controls seek to limit shareholders' returns to a level which could be expected in a competitive market using a theoretical model, the Capital Asset Pricing Model ('CAPM').
- However, actual returns to regulated energy network company shareholders have been persistently materially higher than those calculated by Ofgem using the CAPM model and allowed for in setting prices - in total by £5.5bn over the RIIO-1 price control period.
- As noted in a recent report by the National Audit Office:

  "Under Ofgem's current regulatory framework, electricity network companies have provided a good service, but it has cost consumers more than it should have"
- Whilst there is general agreement that returns have been higher than desired, there is disagreement on the reasons for this which include, *inter alia*:
    - Regulatory information asymmetry
    - Forecasting errors
    - Efficiency incentives
    - Regulatory concerns around incentivising investment
    - Regulatory duties relating to financeability
- Ofgem's past approach to designing price controls has included measures to address each of these potential factors for unnecessarily high returns, but the historical levels of persistent actual outperformance clearly indicate that these efforts have not been effective.
- Ofgem's current RIIO-2 proposals go some way to addressing this problem. In particular, the adjustment for expected outperformance represents a major improvement in price control design.
- However, given past outcomes and the primacy of Ofgem's statutory duty to protect consumers interests, Ofgem should do more to address this issue and ensure that in future returns to shareholders are limited to reasonable levels.
- One way to do this would be for Ofgem to explicitly rebalance its priorities in setting the allowed return in price controls and ensuring there are robust safeguard measures. Such an approach could include Ofgem:

- Strengthening its proposals for addressing outperformance
- Being bolder in setting the cost of capital for a notional efficient company
- Assessing financeability in the context of actual market conditions and investors' appetite to invest in the sector.
- Putting in place safeguard backstop measures to eliminate the risks of shareholders persistently earning unnecessarily high returns.

2.2 Ofgem's Statutory Duties

2.2.1 Ofgem's methodology for calculating the allowed rate of return should be assessed in light of its statutory principle objective to "*protect the interests of existing and future consumers in relation to electricity conveyed by distribution systems or transmission systems*" (in relation to electricity networks" (a similar objective applies to gas networks).[1]

2.2.2 Consumers' interests are clearly not served if prices are set at a level which enables shareholders to earn returns which are persistently higher than necessary.

2.2.3 The RIIO-2 process is taking place against an increased level of concern, and body of evidence, that actual returns to shareholders of the network companies have been significantly higher than those assumed by Ofgem in setting prices (the 'allowed return').[2]

2.2.4 In addition, recent work on the cost of capital in regulated companies by UKRN has concluded that the allowed rates of return set by regulators have been higher than necessary.[3]

2.2.5 Taken together these factors mean that prices have been materially higher than necessary and that as a result consumers' interests have not been best served.

2.2.6 Ofgem's general duties also require it to carry out its functions in the way which it *"considers is best calculated to further the principal objective".*[4] The legislation then requires the regulator to *"have regard to"* "*the need to secure that all reasonable demands for electricity are met*" and "*the need to secure that licence holders are able to finance the activities which are the subject of obligations imposed"* [5]

2.2.7 In structuring the price control, Ofgem must therefore balance the potentially conflicting objectives of protecting consumers from unfair prices and incentivising efficient operation and investment.

2.2.8 Market evidence shows that the UK infrastructure market is highly attractive for domestic and international investors indicating that expected returns are, in general,

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[1] Electricity Act 1989 3A (1) http://www.legislation.gov.uk/ukpga/1989/29/contents

[2] For example, Citizens Advice report, *Monopoly Money, How consumers overpaid by billions, May* 2019 https://www.citizensadvice.org.uk/Global/CitizensAdvice/Consumer%20publications/Monopoly%20Money%20-%20How%20consumers%20overpaid%20by%20billions.pdf

[3] Stephen Wright, Phil Burns, Robin Mason and Derry Pickford, report for UK Regulators Network: *Estimating the cost of capital for implementation of price controls by UK regulators, An update on Mason Miles and Wright (2003*) March 2018 https://www.ukrn.org.uk/wp-content/uploads/2018/03/2018-CoE-Study.pdf

[4] Electricity Act 1989 3A (1b)

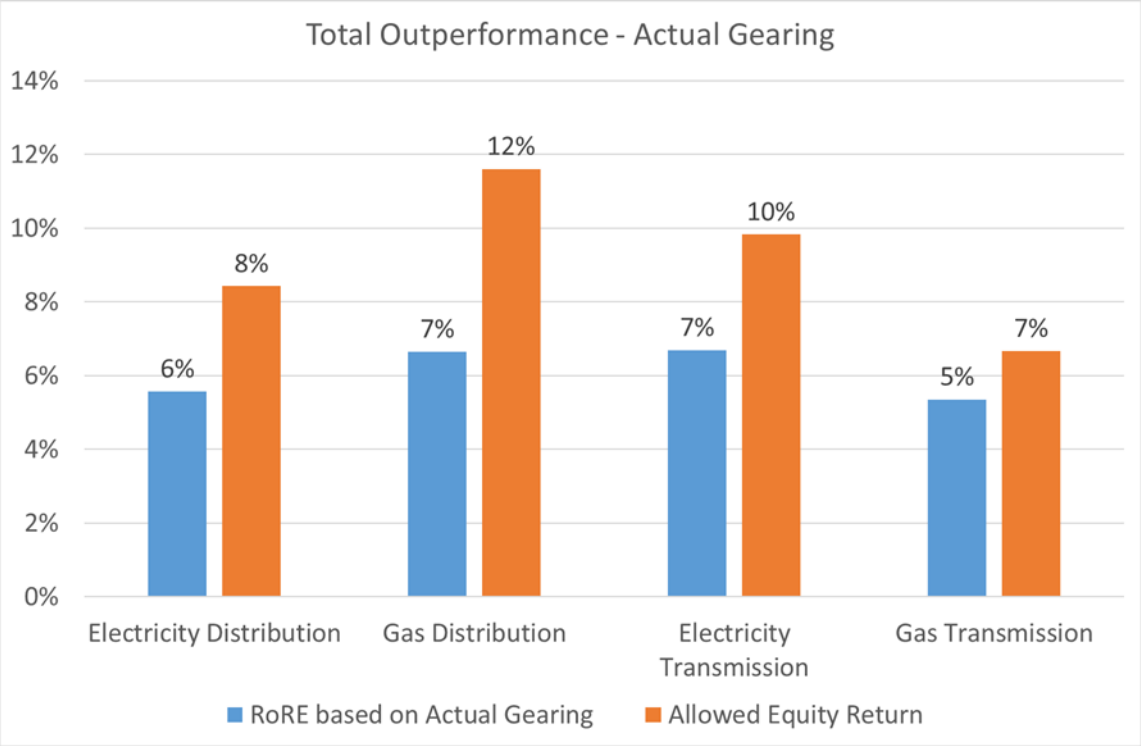
[5] Electricity Act 1989 3A (2)

more than sufficient to meet the minimum requirements of investors. Ofgem can therefore be confident that if it takes appropriate steps to constrain future levels of returns to reasonable levels, it will not be at the expense of future investment.

2.3 Historical levels of returns

2.3.1 Ofgem's most recent data on the financial performance of network companies illustrates the high levels of returns expected to be earned by regulated companies during the RIIO-1 price control period (Ofgem's data is based on actual data for 2016 to 2018 and forecast data for 2019 to 2023). Figure 1 below compares the expected return on regulatory equity compared to the allowed equity return originally allowed by Ofgem.

Figure 1: Price control outperformance (in terms of RoRE based on Notional Gearing - RIIO-1 period)



Source: Ofgem Regulatory Financial Performance Report Annex[6]

2.3.2 Figure 1 shows that shareholders in companies with regulated energy network assets can expect to earn higher returns than Ofgem considered necessary when it set prices for the RIIO-1 period.

2.3.3 In total, over the RIIO-1 price control period total outperformance of £5.5bn is expected.[7]

[6] https://www.ofgem.gov.uk/publications-and-updates/regulatory-financial-performance-annex-riio-1-annual-reports-2017-18

[7] HMK Advisory calculation based on Ofgem's RFPR reports – Actual Gearing basis

2.3.4 As noted in a recent report by the National Audit Office:

> *"Under Ofgem's current regulatory framework, electricity network companies have provided a good service, but it has cost consumers more than it should have"*[8]

2.3.5 The NAO found that

> *"Ofgem designed RIIO-1 so that networks' returns depended on how well they performed. Its expectations were that networks could make a real-terms return on regulatory equity of between roughly 2.5% and 10.5%, but it expected only the best-performing companies to reach the high end of the range. In practice, based on the latest available information, three of the nine network companies are forecasting returns of around 10%, and the average forecast return is 9.2%. By comparison, Ofgem estimates that FTSE-listed companies on average provide returns of 5.25%–5.75%, based on various sources of evidence including historical market data. An Ofgem survey suggests that in recent years investors have come to expect lower returns from the FTSE than this (around 3%–4%), although investors' views are liable to change over time. Investors accept lower returns on lower-risk companies, and regulated utilities such as network companies are seen as lower risk than FTSE-listed companies on average"* [9]

2.3.6 We discuss Ofgem's proposals for incorporating expected outperformance in the allowed return in section 6.

2.4 Incentivising investment

2.4.1 A theoretical argument often put forward for regulators to set the cost of capital at the higher end of estimated ranges (referred to as "aiming up") is to ensure regulated companies are incentivised to invest in new network assets.

2.4.2 However, there is also a risk that if regulators set the cost of capital too high it will simply provide shareholders with an unnecessarily high return.

2.4.3 Whilst the theoretical risk of underinvestment is one which should be considered, the practical need for measures to address it (such as aiming up) need to be considered against actual market conditions.

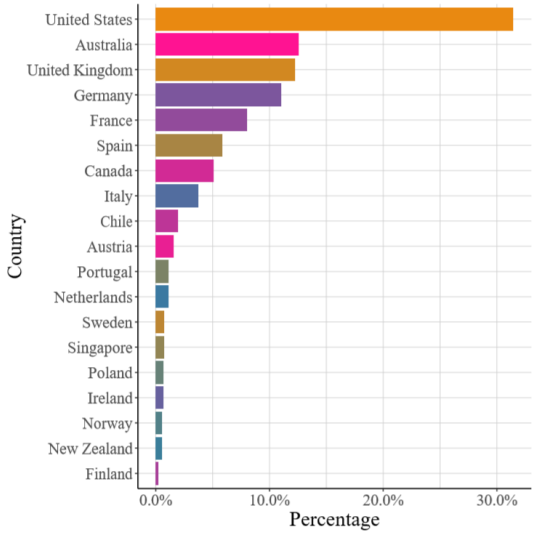
2.4.4 There is ample evidence which indicates that international capital markets (for debt and equity) are very favourable towards infrastructure projects, and UK infrastructure in particular.

[8] National Audit Office *Ofgem, Department for Business, Energy & Industrial Strategy, Electricity Networks*, 30 January 2020 Summary paragraph 20

[9] National Audit Office *Ofgem, Department for Business, Energy & Industrial Strategy, Electricity Networks*, 30 January 2020 Summary paragraph 7

2.4.5 Firstly, Figure 2 below shows a chart from a 2019 study which identified the UK as the country with the third highest potential for infrastructure investment.

Figure 2: Infrastructure markets with the most potential in the next 5 years (advanced economies)



Source: EDHEC Infrastructure Institute 2019 Global Infrastructure Investor Survey, Benchmarking Trends and Best Practices April 2019[10]

2.4.6 Secondly, current market conditions are extremely favourable to utility network operators seeking investment. For example, as recently as September 2019 National Grid was able to raise debt at 1.375%, with commentators commenting on the high level of demand for long-term infrastructure bonds notwithstanding political uncertainty at the time:

> *"NGET acknowledged in the bond's prospectus that potential nationalisation could have a "material" impact on operations. Yet with rates and government bond yields at some of their lowest levels ever, it had double demand for its target.*
>
> *In the end, it issued a 1.375%, 300 million pound, seven-year bond and a 2%, 400 million pound, 19-year bond, said a lead manager. Pension funds starved of long-dated assets came in for the longer bond in particular."*
>
> *"This is a fantastic time to issue debt given the really big drop in the underlying rates and the potential for more central bank stimulus," said the source, who asked not to be named."*[11]

2.4.7 The current attractiveness of UK utility companies to investors (who will already have taken into account the most recent Ofwat and Ofgem proposals for allowed rates of

[10] https://edhec.infrastructure.institute/wp-content/uploads/2019/04/EDHECinfra_GIH_2019_Survey.pdf

[11] https://www.reuters.com/article/britain-eu-nationalgrid-bonds/rpt-investors-ignore-corbyn-risk-to-grab-uk-power-grid-debt-idUSL5N2613HB

returns) indicates that there is no need for Ofgem to aim up in setting its allowed rates of return.

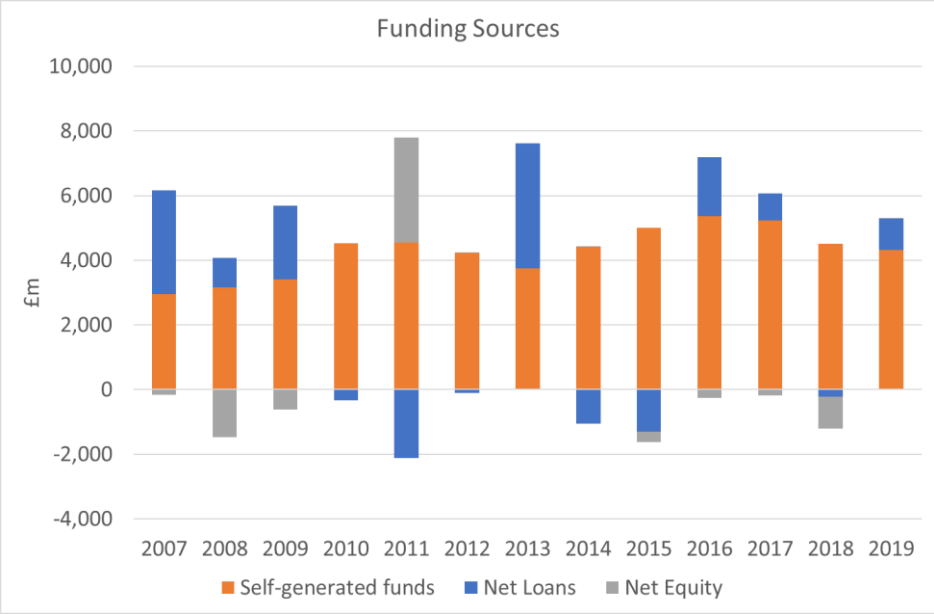
2.4.8 Clearly Ofgem should not constrain the profitability of operators to a level at which they cannot raise funds, but all the evidence indicates that there is a very large amount of surplus profitability to eliminate before that becomes a real risk.

2.4.9 Notwithstanding the evidence which suggests there is no need in practice to aim up , if Ofgem does adjust allowed returns (i.e. by aiming up) to incentivise new investment then any adjustment should only apply to new investments, not the existing Regulatory Asset Base ('RAB') (otherwise existing providers of finance are being paid an unnecessary margin on their current actual required rate of return).[12]

2.4.10 In this context, it is relevant that nearly all new funding for network operators' new investment comes from internally generated funds or debt– very little new equity is raised in the market to finance new investments.

2.4.11 This is illustrated in Figure 3 below which shows cash funding from self-generated funds, debt and equity sources available to National Grid plc between 2007 and 2019.

Figure 3: Funding sources: National Grid plc



Source: HMK Advisory analysis of National Grid plc annual reports

2.4.12 Figure 3 shows that for National Grid plc:

- In all but one year (2011 when there was a large rights issue), equity funding was a cash outflow to the business (i.e. shares were purchased back by the company). Indeed, over the period, net funding from equity was negative overall.
- Over the period 2007 to 2019 net funding from loans amounted to £8.8bn, compared to £55.4bn in self-generated funds

[12] See 2018 UKRN Report, *Estimating the cost of capital for implementation of price controls by UK Regulators, page 72.*

2.4.13 The reasons why so little new investment is funded by new equity are explained by the 'pecking order theory' which states that, because of information asymmetry between managers and investors, firms have funding preferences which are inconsistent with theoretical optimisation models of the CAPM.[13] In particular the theory states that firms will adopt a hierarchical order of financing preferences: internal finance is preferred to external financing, and if external financing is needed, firms first seek debt funding. Equity is only issued as a last resort.

2.4.14 For the purposes of incentivising investment through the allowed rate of returns, the returns required by *new* investors are therefore in practice irrelevant – the evidence shows that they will generate an insignificant proportion, if any, of new funds over the long term.[14]

2.4.15 There are other reasons why the regulator will want to provide a return to current shareholders, aside from incentivising new equity investment – and these are considered in 2.5 below.

2.5 Financeability

2.5.1 Ofgem's statutory duties include the need to ensure network operators can finance their activities - referred to as a financeability duty.

2.5.2 However, there is a risk that this obligation has the unintended consequence that regulators are unnecessarily cautious in setting the allowed rate of return.

2.5.3 Ofgem has notes that its statutory responsibility in regard to financeability is limited to "having regard" to need of companies to finance their activities and that the RIIO model of regulatory settlement is in general terms sufficient to ensure that companies are financeable in the long run.[15]

2.5.4 There is therefore clearly no need to "aim-up" or otherwise adjust a calculation of the allowed rate of return out of concerns relating to financeability.

[13] The theory in its current form was set out by Myers and Majulf in: *Corporate Financing And Investment Decisions When Firms Have Information That Investors Do Not Have (*1984, Journal of Financial Economics)

[14] The very small percentage of investments funded by new equity is demonstrated in a wide range of studies. As Myers notes in an earlier article: "*There are plenty of examples of firms issuing stock when they could issue investment-grade debt. But when one looks at aggregates, the heavy reliance on internal finance and debt is clear. For all non-financial corporations over the decade 1973–1982, internally generated cash covered, on average, 62 percent of capital expenditures, including investment in inventory and other current assets. The bulk of required external financing came from borrowing. Net new stock issues were never more than 6 percent of external financing*" (Myers, 1984, The Capital Structure Puzzle, Journal of Finance, July 1984)

[15] Ofgem, 24 May 2019, *RIIO-2 Sector Specific Methodology Decision – Finance* paragraph 4.27.

3 Actual market forecasts vs Ofgem's forecast

3.1 Summary

- The CAPM approach requires the allowed rate of return to be set at the level which reflects investors' required rate of return to invest in a market. This will be based on overall expectations of future market performance – the expected total market return ('TMR').
- The practical difficulties of obtaining a robust view of current expectations has meant that regulators have historically used a proxy for actual market expectations in calculating the allowed return – their own forecasts of future returns based on historical long-term averages.
- Ofgem is proposing to continue with this approach and estimate a range for TMR of 6% - 7% CPIH real based on historical returns, narrowed to 6.25% to 6.75% in their calculation pf allowed returns.[16]
- There is significant evidence that current actual expectations of future returns are below those earned historically.
- Ofgem's cross-checking exercise published in its May 2019 decision did include an assessment of investment managers' forecasts. But this was based on forecasts from as long ago as September 2017. We have updated Ofgem's estimate of fund managers' forecasts and find an average TMR estimate of 4.2% CPIH real (compared to Ofgem's 5.5%).
- If Ofgem fails to reflect the difference in current actual TMR forecasts and historical TMR, it will gift shareholders an unnecessarily high return.
- Ofgem should therefore update its assessment of fund managers' forecasts of TMR at the determination stages and if, as is currently the case, actual market forecasts for TMR are below Ofgem's own forecasts based on historical returns it should use an average of the available actual market forecasts.

3.2 Estimating Total Market Return ('TMR')

3.2.1 In order to avoid gifting shareholders an unnecessarily high level of return at the expense of consumers, it is essential that the allowed rate of return is not higher than that needed in order for the network operators to finance their activities – the market's required or expected level of returns in the future.

3.2.2 Regulators have tended not to use direct evidence of actual market expectations on the basis that gathering a robust and accurate review of market expectations is not straightforward. Different forecasts may be prepared on different bases at different times, the underlying assumptions may not always be clear, some forecasts may have more general credibility than others, some forecasts may not be available on a consistent

[16] CPIH real refers to returns in real terms after allowing for inflation based on the CPIH index, where CPIH refers to Consumer Price Index including owner occupier housing costs

basis and some may be biased in a particular direction.[17]

3.2.3 Instead of using actual investor market forecasts, Ofgem, like other UK regulators, have used a proxy forecast – their own forecast based on historical long-term actual returns. This approach has the benefit that it can readily be measured in an objective way and is capable of rigorous statistical analysis.

3.2.4 However, if the evidence shows, as it does, that actual forecasts are lower than the proxy forecast, it is clear that regulators must amend their approach to avoid setting an unnecessarily high allowed rate of return - either by adjusting their own forecast or using actual market forecasts.

3.2.5 This reality check is critical if shareholders are not to be gifted unnecessarily high returns. If investors today expect to earn a return of, say, 4%, then the fact that in the past they may have earned 6% is irrelevant. If the regulatory regime provides them with a (forecast) 6% return, the excess will be reflected in an increase in the value of the company and a windfall gain to shareholders at the expense of consumers.

3.2.6 The high levels of Market-to-Asset ratios described in section 4.3 provide strong evidence that this is exactly what has happened.

3.2.7 In its 2014 decision on the Northern Ireland Electricity price control, the Competition Commission recognised the need to consider whether or not actual historical returns needed to be adjusted to reflect current expected returns, and that any estimate of expected returns should be subject to a 'common sense' test:

> *"In applying the CAPM, we seek to derive the* expected *return on the market. This is not necessarily the same as the realized return, even over long time horizons, if unexpected events occur. In this regard, we note that attempts to estimate the historical expected ex ante return suggest that this is considerably lower than the realized return."*
>
> *"A forward-looking expectation of a return on the market of 7 per cent [based on historical returns] does not appear credible to us, given economic conditions observed since the credit crunch in 2008 and lower expectations of returns".*[18]

3.2.8 The importance of evidence of actual market conditions compared to historical precedents was noted by the NAO in its 2020 report on Ofgem:

> *"in our assessment, Ofgem erred in placing too much weight on consistency with previous regulatory decisions when it set the baseline rate of return, and not enough weight on the most up-to-date market evidence, which suggested network company risk was lower"*[19]

[17] The Competition Commission noted that there is a large body of literature which suggests that there may be a tendency for analysts' forecasts to overreact to changes and on average to be too optimistic, for example W F M DeBondt and R H Thaler (1990), 'Do Security Analysts Overreact?', American Economic Review 80, pp52–57. (Competition Commission, 26 March 2014, Northern Ireland Electricity Limited price determination, footnote 54

[18] Competition Commission, *Northern Ireland Electricity Limited price determination, Final Determination*, 26 March 2014, Paragraph 13.146

[19] National Audit Office *Ofgem, Department for Business, Energy & Industrial Strategy, Electricity Networks*, 30 January 2020 Summary paragraph 8

3.3 Ofgem's cross-check using investment managers' forecasts

3.3.1 Ofgem does include in its calculation of the cost of equity two cross-checks involving actual market forecasts – investment managers' forecasts and infrastructure funds discount rates. We discuss the latter in section 4.5.

3.3.2 Ofgem's assessment of investment managers' forecasts was set out in its May 2019 decision, using nine forecasts dating between September 2017 and January 2019. We have updated these forecasts and, in one case identified a more appropriate UK (rather than EU) market forecast.[20]

3.3.3 The updated results are shown in Table 1 below.

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Table 1: Current TRM Forecast

	Ofgem's December May 2019 Analysis				Updated Analysis: January 2020					Change from Ofgem analysis
Source	**Date**	**Scope**	**Time Horizon**	**Nominal**	**Date**	**Note**	**Scope**	**Time Horizon**	**Nominal**	
Schroders	Jan '19	UK	30	7.9%	Sept '19[21]	a	UK	10yr	3.9%	-4.0%
Blackrock	Dec '18	EU	10	7.5%	Sept '19[22]	b	UK	10yr	4.9%	-2.6%
Old Mutual	Dec '18	UK	L Term	7.0%	Sept '19[23]	c	UK	10yr	6.39%	-0.55%
Nutmeg	Sept '17		10+	6.8%	No Update available					
FCA	Sept '17	UK	10-15	6.6%	No Update available					
Aon Hewitt	June '18	UK	10	6.4%	June '19[24]		UK	10yr	6.7%	+0.3%
Redacted	Nov '18	UK	10	6.2%	No Update available					
Aberdeen AM	Dec '17	UK	10	5.9%	No Update available					
JP Morgan	Sept '18	UK	L Term	5.6%	Sept '19[25]		UK	Long term	6.1%	+0.5%
Willis TW	Dec '18	UK	10	4.2%*						
Vanguard	Nov' '18	UK	10	4.0%*	Nov '19[26]	d	UK	10yr	5.0%	n/a
		Mean		**6.7%**		**e**			**5.5%**	**-1.2%**

Source: HMK Advisory analysis

* Ofgem excluded from calculation of mean

[21] https://www.trustnet.com/news/7458798/investors-might-be-disappointed-after-downgraded-10-year-returns-forecast
[22] https://www.blackrock.com/institutions/en-us/insights/charts/capital-market-assumptions
[23] https://www.oldmutualwealth.co.uk/Adviser/investment-and-funds/investment-process/strategic-asset-allocation/latest-asset-allocation-quarterly-reviews/September-2019-update/
[24] https://www.aonhewitt.com/getmedia/06b4ae6b-729b-42bf-a731-daae57e8d4d5/Capital-Market-Assumptions-30-June-2019.aspx
[25] https://am.jpmorgan.com/blob-gim/1383647203392/83456/JPM52180%20LTCMA%202020%20MATRIX%20-%20GBP.pdf
[26] https://www.vanguardinvestor.co.uk/articles/latest-thoughts/markets-economy/hitting-the-reset-button

Notes

a. Schroders 30-year forecast does not appear to have been updated since January 2019. In any case, a ten-year time horizon is a more reasonable one against which to assess returns for the prices for a 5-year price control period. The Schroders September 2019 forecast of 3.9% represented a reduction of 0.7% from their previous (undated) forecast.

b. Ofgem's analysis included a forecast from Blackrock for European equities. We consider it more reasonable to include their UK market forecast as this provides a better comparator for assessing UK companies and is consistent with Ofgem's other benchmarks. Blackrock's estimate is a mean expected return for "*UK large cap equites*."

c. The September 2019 Old Mutual review to June 2019 stated:

   "The projected expected returns for UK equities fell from 6.45% p.a. to 6.29% p.a."

   The 6.29% figure was stated net of expenses, but we have used the corresponding stated "fully gross return" of 6.39%

d. Ofgem disregarded Vanguard's estimate from its analysis on the basis that "*appears to be…based on a 40% bond portfolio and therefore it may be downward-biased for out purposes*"[27]. The more recent November 2019 document from Vanguard stated:

   "In the case of shares, the expected annualised return for the UK over the next ten years is in the 4% to 6% range, while for the rest of the world, the expected equity return in sterling terms is slightly slower at 3.5% to 5.5% per year.

   ……

   Even so, we believe the outlook for returns is likely to remain much lower than in previous decades or compared with the post-crisis years."

   In our analysis we have taken the mid-point of Vanguard's estimate for UK equities – 5%.

e. In line with Ofgem, we have ignored the Willis TW estimate on the basis it included returns from hedging.

3.3.4 Our updated review of benchmarks shown in Table 1 provides an average expected market return of 5.5% nominal compared to Ofgem's previous estimate of 6.7%.

3.3.5 Investment managers' forecasts are stated as geometric averages and, in its analysis, Ofgem adjusted these to an arithmetic average as follows:

[27] Ofgem, Consultation, *RIIO-2 Sector Specific Methodology Annex: Finance* 18 December 2018, paragraph 3.92.

"we assume an uplift of 1%, which we believe is appropriate based on the JP Morgan publication (which implies a differential between arithmetic and geometric forecasts of 0.82%).

Note that this simplification is for demonstration purposes and may not be appropriate for all values"[28]

3.3.6 Ofgem do not explain why they apply a higher adjustment than that implied by the JP Morgan data. In their most recent September 2019 forecasts, the arithmetic mean return in JP Morgan's forecast for 'UK Large Cap' equities is 6.9% compared to their geometric mean of 6.1%, a difference of 0.8%.[29]

3.3.7 Applying this difference of 0.8% to the average of updated geometric means of 5.5% in Table 1 provides an estimated average arithmetic mean of investment managers' forecasts of 6.3% nominal, compared to Ofgem's equivalent mean of 7.65% nominal.

3.3.8 In order to convert their nominal forecast to a real value, Ofgem deduct 2% (using the Fisher equation) to give a forecast of 5.5% CPIH real.

3.3.9 Ofgem do not explain why they do not consider the implications of the difference between their TMR forecast based on investment managers' forecasts of 5.5% CPIH real and their TMR forecast of 6.0 - 7.0% CPIH real based on historical returns.

3.3.10 Applying the same inflation adjustment of 2% using the Fisher equation to the updated investment managers' forecast of 6.3% nominal gives a TMR forecast of 4.2% CPIH real. This compares to Ofgem's TMR assumption of 6.25 to 6.75% CPIH real.

3.3.11 In their cross-checks, Ofgem calculate a cost of equity from investment managers' forecasts of 4.0%.[30] They then compare that to the lower value of their cost of capital range based on historical returns - also 4% - and conclude that the two are consistent.

3.3.12 However, Ofgem's calculation of a 4% cost of equity from historical TMR assumes a beta of 0.66 whilst the cost of equity of 4% from investment managers' forecasts is calculated using a beta of 0.75.[31]

3.3.13 The two cost of equity calculations are clearly inconsistent, and the correct approach to obtaining a consistent cross-check is to apply the same beta assumption – i.e. 0.66 for a 'low' value in a cross-check range. The cost of equity implied by the investment managers' forecast based on a beta of 0.66 is then 3.5% - below Ofgem's stated range (4.00% - 5.60%). On this basis Ofgem's view that its TMR estimates are in line with those of investment managers is wrong.

3.4 Conclusion

3.4.1 Ofgem should update its assessment of fund managers' forecasts of TMR at the determination stages.

[28] Ofgem, 24 May 2019, *RIIO-2 Sector Specific Methodology Decision – Finance* paragraph 3.90.
[29] JP Morgan September 2019, *2020 Long-Term Capital Market Assumptions*
[30] Ofgem, 24 May 2019, *RIIO-2 Sector Specific Methodology Decision – Finance*, Table 10.
[31] Ofgem, 24 May 2019, *RIIO-2 Sector Specific Methodology Decision – Finance*, Table 11 and Table 10.

3.4.2 If, as is currently the case, actual market forecasts for TMR are below Ofgem's own forecasts it should use an average of the available actual market forecasts in order to avoid providing unnecessarily high returns to shareholders at the expense of consumers.

4 Ofgem's other cross checks for the cost of equity

4.1 Summary

- In addition to investment managers' forecasts discussed in section 3, Ofgem also cross-check their TMR and cost of equity forecasts based on historical returns to those based on:
    - An alternative forecasting model, the Dividend Growth Model (DGM)
    - Market to Asset Ratios ('MAR's)
    - Returns included in bids by investors in competitions run by Ofgem (Offshore Transmission Owners (OFTO's))
    - Infrastructure Fund discount rates
- Ofgem states that its DGM cross-check indicates a TMR return of approximately 8% nominal, or 6% CPIH real.[32] However, that calculation is based on an assumption that dividend growth will equal economic growth, an assumption which the Competition Commission has previously criticised as "*essentially arbitrary*". An alternative approach, using long term dividend growth data, which Ofgem model as a sensitivity, gives a return of 6.75% nominal or 4.7% CPIH real, below Ofgem's TMR forecast based on historical returns of 6.25%-6.75% CPIH real. Ofgem do not explain why this valid result is excluded from their discussion of cross checks.
- Ofgem do not use the data on Market-to-Asset Ratios as a means of cross checking their TMR or cost of equity calculations but note that "*MARs evidence indicated that investors were expecting to earn returns in excess of their cost of capita*". This issue is discussed in Section 6.
- In principle, OFTO bids provide good evidence of actual investor expectations in regulated energy network markets. However, the OFTO bids used by Ofgem as a cross-check date are more than a year old. Given the reduction in expected returns since then (as discussed in Section 3), any comparisons of the cost of capital from the bids should therefore reflect the changes in market expectations since the data of the bids. Ofgem should update its analysis with more recent data if that is available when it publishes its determinations.
- We have updated Ofgem's analysis of infrastructure fund discount rates in the May 2019 Decision and find that they have fallen slightly (from 7.55% nominal to 7.35% nominal). Ofgem do not explain what they use the infrastructure funds discounts rate to cross check – TMR or the cost of equity. Absent data on the funds' betas it is not possible to use the data as a cross-check of either the TMR or the cost of equity as the expected returns of an infrastructure fund could be expected to fall between the two.

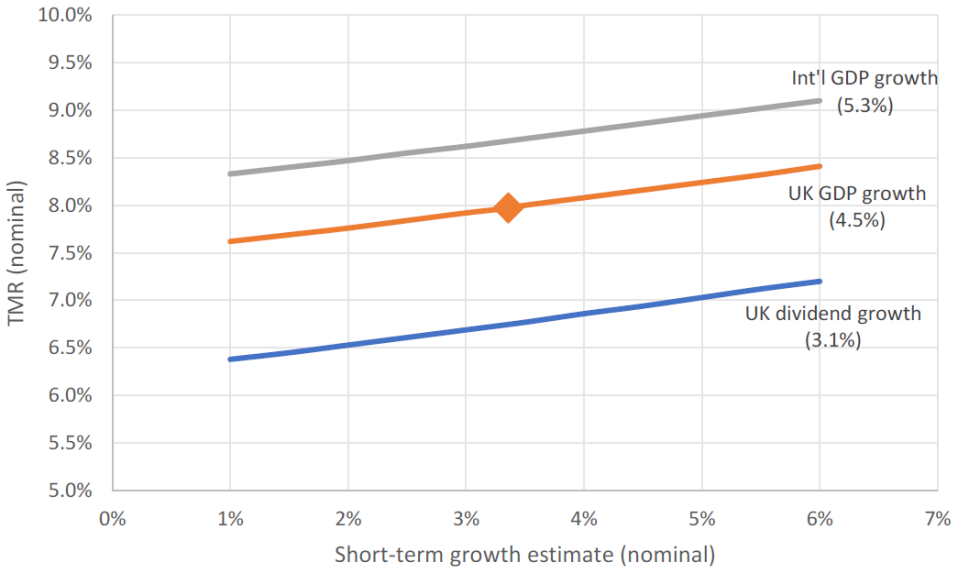
[32] Ofgem's calculation of 6% CPIH real is "*after deducting 2% for the CPIH expectation and ignoring the Fisher equation for simplicity*" (paragraph 3.103 of the May 2019 Decision). Applying the Fisher equation provides for a return of 5.88%, a difference of 0.12%.

4.2 Dividend Growth Model ('DGM')

4.2.1 The DGM is an alternative theoretical model for forecasting market returns to the CAPM model, but like the CAPM, as a theoretical model it does not provide a cross-check against actual expectations of future market returns

4.2.2 It provides a useful alternative forecast model, but like any such model is sensitive to assumptions. Ofgem's advisors CEPA, presented several different sensitivities for the outputs of their DGM using various assumptions for growth rates, as shown in Figure 4 below.

Figure 4: Dividend Growth Model sensitivities



Source: Ofgem[33]

4.2.3 As shown in Figure 4, Ofgem's benchmark DGM TMR of 8% nominal is based on a dividend growth assumption equal to UK GDP. However, as the Competition Commission noted:

> *"it is essentially arbitrary to assume future long-run growth in dividends per share equal to potential economic growth. Indeed, we see empirical support for expecting long-run growth in dividends per share to be less than potential economic growth"*[34]

4.2.4 A DGM model based on dividend growth assumptions therefore represents a valid approach to cross checking the CAPM model. Rather than simply present a single point estimate, Ofgem should, as a minimum, present a range which includes the lower dividend growth sensitivities. On that basis it would be reasonable to say the that the DGM provides for a range of 6.6% to 8.7% nominal or 4.6% to 6.7% CPIH real.

[33] Ofgem, Consultation, *RIIO-2 Sector Specific Methodology Annex: Finance* 18 December 2018, Figure 21, page 94.
[34] Competition Commission, *Northern Ireland Electricity Limited price determination, Final Determination*, 26 March 2014, paragraph 13.153.

4.3 Market-to-Asset Ratios (MARs)

4.3.1 As Ofgem explains in its December 2018 consultation, the ratio of the market value of an asset to its regulated asset value (RAV) provides a useful insight on the difference between shareholders' expected returns from a regulated asset and the allowed return assumed by a regulator. Ofgem notes:

> *"A ratio greater than 1 implies that investors are paying a premium to own network assets. An investor would do this on the expectation that the return from network ownership is greater than the investor's cost of equity. Similarly, a Market-to-Asset ratio less than 1 would imply that investors do not expect to earn a regulatory return greater than their cost of equity."*[35]

4.3.2 In its December consultation, Ofgem presents compelling evidence that MARs for regulated energy networks are greater than 1 indicating that investors expect to earn a higher return than their cost of capital. Furthermore, as Ofgem comment:

> *"We find, however, that the payback that investors must be assuming, in order to match the premia paid [i.e. for MAR >1], must extend well beyond the end of the RIIO-1 period. In other words, investors appear to expect to outperform regulatory settlements that have not yet been determined."*[36]
>
> *and*
>
> *"on the evidence available, these premia suggest that investors are expecting to earn returns well in excess of their costs of capital."*[37]

4.3.3 In its May 2019 decision, Ofgem comment that the network companies argue such a premia could be due to a control premium being paid or a 'winners curse', and note that *"these arguments are largely anecdotal in nature*" and that the network companies *"did not provide convincing evidence".*[38]

4.3.4 Notwithstanding the evidence it has obtained, Ofgem do not appear to consider the implications of high Market-to-Asset ratios in their approach to calculating the allowed return.

4.3.5 In particular, the evidence provided from MARs of a persistent expectation from investors that they can earn a higher than required rate of return from regulated assets strongly supports the case for making an adjustment for expected out-performance in the allowed return – discussed in section 6.

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[35] Ofgem, 18 December 2018, *Consultation*, *RIIO-2 Sector Specific Methodology Annex: Finance*, para 3.119.
[36] Ofgem, 18 December 2018, *Consultation*, *RIIO-2 Sector Specific Methodology Annex: Finance*, para 3.126.
[37] Ofgem, 18 December 2018, *Consultation*, *RIIO-2 Sector Specific Methodology Annex: Finance*, para 3.128.

[38] Ofgem, 24 May 2019, *RIIO-2 Sector Specific Methodology Decision – Finance* paragraph 3.210.

4.4 Bids for Offshore transmission assets

4.4.1 Ofgem have used 3 bids in 2017-18 to calculate an average nominal rate of return of 7.2% as a cross-check (5.15% CPIH real).39 In principle, OFTO bids provide good evidence of actual investor expectations in regulated energy network markets. However, the OFTO bids used by Ofgem as a cross-check date are more than a year old. Given the reduction in expected returns since then (as discussed in Section 3), any comparisons of the cost of capital from the bids should therefore reflect the changes in market expectations since the data of the bids.

4.4.2 Ofgem should update its analysis with more recent data if that is available when it publishes its determinations.

4.5 Infrastructure funds

4.5.1 Ofgem's cross-checks include the discount rates used by infrastructure funds to value their investments on a discounted cashflow basis.

4.5.2 We have updated Ofgem's benchmark infrastructure funds and find that there has been as small reduction in average discount rates of -0.2% (from 7.55% to 7.35% nominal) in the period since Ofgem prepared its analysis. The updated discount rates are set out in Table 2 below.

[39] Ofgem, 24 May 2019, *RIIO-2 Sector Specific Methodology Decision – Finance* Table 10 page 65.

Table 2: Updated Infrastructure funds discount rates analysis

	Ofgem's May '19 Analysis	Updated Analysis: January 2020		Change from Ofgem's May '19 Analysis
Fund	**Discount Rate**	**Date**	**Discount Rate**	
BBGI SICAV	7.2%	Interim results June 2019[40]	7.1%	-0.1%
John Laing Infrastructure	7.3%	N/a – fund was taken over		
HICL Infrastructure	7.2%	Interim Report 30 September 2019 [41]	7.1%	-0.1%
GCP Infrastructure	7.8%	Annual Report September 2019[42]	7.58%	-0.22%
International Public Partnerships	7.9%	Interim Results June 2019[43]	7.62%	-0.28%
Ofgem average (highest and lowest)	**7.55%**	**Updated average**	**7.35%**	**-0.2%**

Source: HMK Advisory analysis

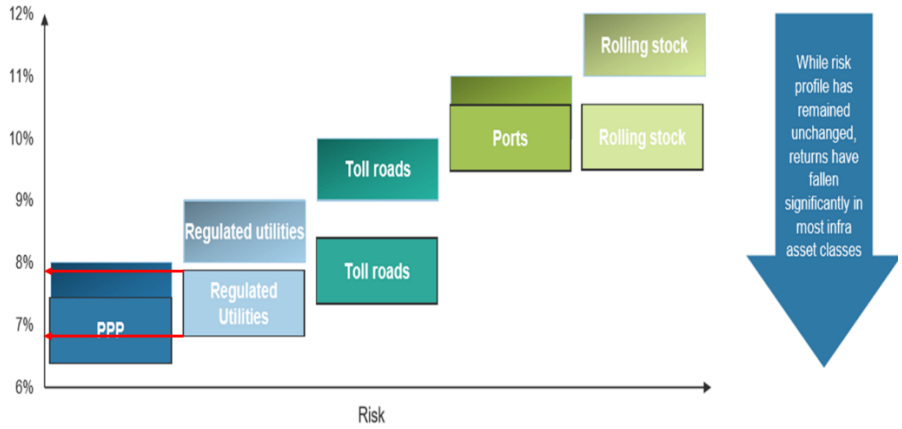
[40] https://www.bb-gi.com/media/1845/2019-bbgi-interim-results-presentation-final.pdf p18
[41] https://www.hicl.com/sites/default/files/HICL_Interim%20Report%202019_vF.pdf p17
[42] https://www.graviscapital.com/funds/gcp-infra/literature/annual-report-sep-2019 p33
[43] https://www.internationalpublicpartnerships.com/media/2145/inpp-interim-2019.pdf p28

4.5.3 The updated infrastructure funds discount rate of 7.35% nominal is equivalent to 5.2% CPIH real after allowing for 2% inflation using the Fisher equation.

4.5.4 The discount rates of infrastructure funds do not provide a direct comparator for either the TMR or the cost of equity. This is because the risk (in terms of beta) of a fund with a mix of assets will typically fall between the total market risk and that for a notional regulated energy network firm. In order to directly compare the fund's discount rate to either the TMR or the company specific cost of equity, it would be necessary to make an adjustment to reflect the differences in betas between the fund and that of the market as a whole or for regulated network companies. The relative mix of types of asset in each fund will determine whether the relative risk of the fund to the market as a whole.

4.5.5 For example, one of the funds in Ofgem's review, BGGI, breaks downs the returns expected in different types of infrastructure investments as shown in Figure 5 below (this is an updated version of the chart shown by Ofgem in its May 2019 decision as Figure 15.)[44] .

Figure 5: June 2019 BGGI Infrastructure returns expectations



Source: BGGI[45]

4.5.6 Figure 5 illustrates that, in general, required returns from infrastructure investments vary significantly. It also indicates that required returns from regulated utilities are amongst the lowest of all infrastructure sectors – which would imply a relatively lower beta.

4.5.7 Without making any adjustment for differences in betas, the infrastructure funds discount rates do not therefore represent a valid benchmark to assess either TMR or the cost of equity for a regulated network company.

[44] In line with investment managers' forecasts the expected returns from regulated utilities has fallen from the level in the chart shown by Ofgem which was dated June 2018 compared to the June 2019 chart presented here.
[45] https://www.bb-gi.com/media/1845/2019-bbgi-interim-results-presentation-final.pdf

4.5.8 In its May 2019 decision, Ofgem did not adjust the infrastructure funds average rate of return for differences in beta before comparing it to its proposed cost of capital for regulated network companies. If Ofgem proposes to use the infrastructure funds discount rates as benchmark it must consider how to adjust these to reflect the difference in beta.

5 Equity Beta

5.1 Summary

- Ofgem's calculation of the equity beta for a notional network company is based on a sample of five companies. Such a small sample will only provide a good measure of the beta for a notional pure regulated energy network business if the risk profiles of the sample accurately reflect the notional company. They do not.
- Only two of the sample have regulated energy network businesses - SSE and National Grid. SSE also have (or had) unregulated retail and waste treatment activities. The other two companies in the sample, Pennon and United Utilities operate regulated water and waste water networks, but it is not obvious why the risk profiles for these companies will necessarily be the same as a regulated energy network – in the US, betas for water utilities are 70% higher than those of electricity utilities.
- Ofgem should therefore look for alternative measures of the risks of regulated wholesale energy networks. Suitable measures of regulated energy market risk may be available in the US where there are large numbers of quoted regulated utility companies. Most recent data for 37 US utility companies suggests asset betas of between 0.17 and 0.32 – significantly below Ofgem's proposed range of 0.35-0.40.
- Whilst the differences in market structures and other factors make direct comparisons difficult, the lack of robust data in the UK means that Ofgem should do more work to understand the reasons for the difference in UK and US betas and whether US data implies Ofgem has unnecessarily overstated the beta used in its calculation of the cost of equity.

5.2 Ofgem's sample for beta calculations

5.2.1 Ofgem's calculation of beta is based on a small sample – five companies. For the beta of such a small sample to be a good proxy for those of a notional regulated wholesale energy network operator, it is important that they share the same underlying risk profile.

5.2.2 Three of these businesses do not operate regulated energy networks - United Utilities, Pennon and Severn Trent. United Utilities and Severn Trent operate retail as well as wholesale regulated water supply and waste-water treatment activities as well as other unregulated activities. Pennon operate regulated wholesale and retail water and waste-water businesses and a waste treatment business.

5.2.3 National Grid and SSE do operate regulated UK wholesale energy networks, but they also operate other activities – primarily National Grid's US activities and SSE's generation and energy retail activities (although its retail business was sold in September 2019).

5.2.4 The risk profile for these businesses will clearly be different to a business whose only activity was running a regulated energy network – and, in general terms, other unregulated activities would be expected to be riskier than a regulated network business. However, it is very difficult to assess the scale of any difference without data for quoted pure wholesale UK energy network operators – which does not exist.

5.2.5 Given the shortage of UK data, Ofgem should consider evidence on betas from other countries. The US provides a good potential source of data as there are many quoted utility companies, included energy network operators.

5.3 Evidence on Beta from US utilities

5.3.1 The Stern School of Business and New York University maintains a widely referenced database of cost of capital data.

5.3.2 Their database includes data on 16 companies in the 'Utility (General)' category. We have not reviewed in detail the operation of these companies, but they appear to be primarily related to the provision of wholesale and retail energy network services (water utilities are included in a separate category). Beta details for these businesses and 17 water utilities are shown in Table 3 below.

Table 3: US Betas – Utilities

	Utility (General)	**Utility (Water)**
Number of companies	16	17
Average ungeared beta corrected for cash average 2015-2020	0.27	0.45

Source: NYU Stern Business School[46]

5.3.3 The unlevered beta of 0.27 for the 'Utility (General)' category compares to Ofgem's beta estimate range of 0.35 – 0.40.[47] The level of this difference should, as a minimum give Ofgem cause for concern and it should do further analysis to understand why there is such a difference and if it indicates its own beta estimate is unnecessarily high.

5.3.4 In addition, the fact that betas for water companies are 70% higher than those for electricity operators at least casts doubt on Ofgem's decision to use the beta of UK water companies as a basis for estimating the beta for regulated energy network businesses.

5.3.5 In its May 2019 decision Ofgem dismisses the use of international evidence on beta, noting the view of its advisors, Indepen, who stated in their report that:

> *"Taken all together we do not think international comparisons provide an answer to the question of how to estimate a β for setting price controls in the UK"*[48]

5.3.6 We agree that there are methodological issues to consider and that there may be reasons why betas in the UK are higher than those in the US, but given the very weak foundations of any calculations based solely on UK data, Ofgem should reconsider its rejection of international comparisons and assess whether they could provide an alternative measure of the underlying risks of regulated energy networks.

[46] http://www.stern.nyu.edu/~adamodar/New_Home_Page/data.html
[47] Ofgem, 24 May 2019, *RIIO-2 Sector Specific Methodology Decision – Finance* Table 8
[48] Indepen, *Ofgem Beta Study – RIIO-1, Main Report December 2018*, Page ix

6 Adjustment for Expected Outperformance

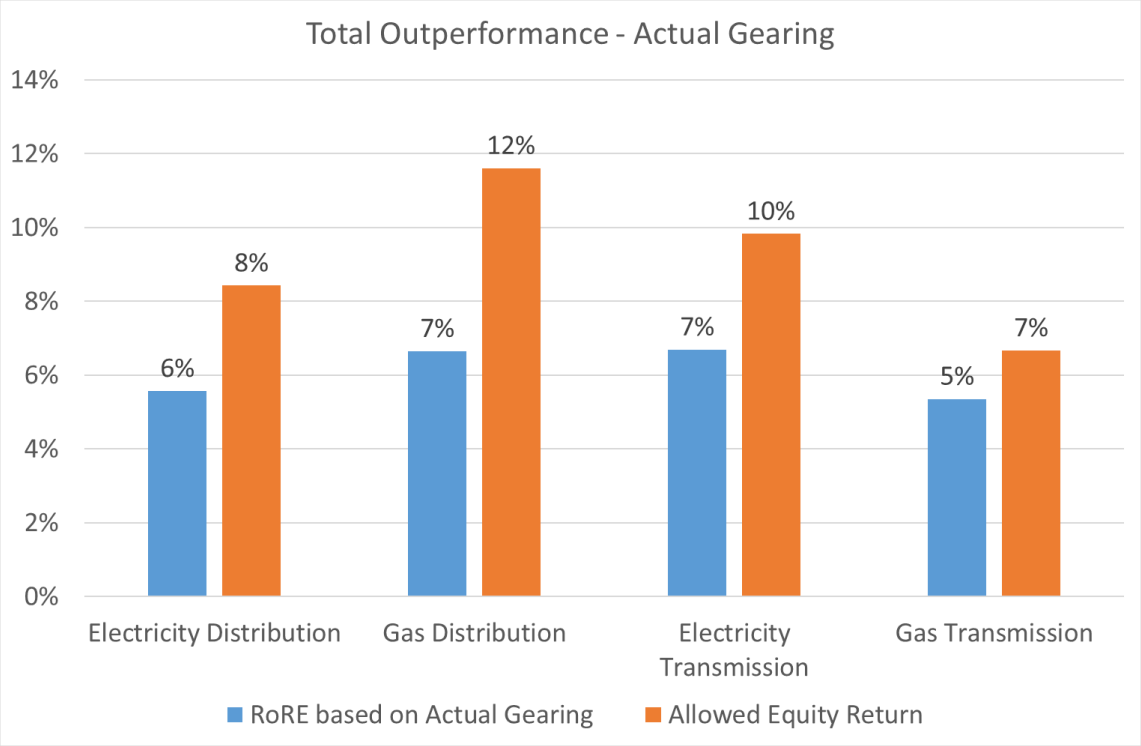
6.1 SUMMARY

- Over the RIIO-1 price control period, regulated network operators are expected to outperform the allowed level of return by £5.5bn – at the expense of consumers.
- Recent work for the UK Regulators Network by Wright et al has provided a theoretical framework and recommendations to address several problems in the previous approach to calculating the allowed rate of return.
- A key insight developed by Wright et al is a recognition that there is a difference between the regulators allowed rate of return, used to set prices, and shareholders expected return. Such a difference can arise where, as is the case in regulated energy network markets, shareholders in regulated companies as a matter of course expect the company to outperform relative to the price control. Put simply, if shareholders require 5% to invest and assume that the company will outperform the price control by 2%, then the regulator should set allow a return of 3%. Shareholders will still be willing to invest as they expect to achieve their required return of 5% (3% + 2%) and consumers will not have to finance an unnecessary excess return of 2% to shareholders.
- Financial markets expect regulated assets to continue to generate higher returns than required – evidenced by very high Market-to-Asset ratios.
- The need for a change in approach from Ofgem to calculating the allowed return to constrain future outperformance and ensure consumers' interests are protected is clear.
- Ofgem's proposals to make an adjustment to the CAPM derived cost of capital to allow for the difference between allowed return and expected return follow on from Wright et al's insight, but do not go far enough.
- Firstly, Ofgem's working assumption of the level of the difference between allowed and expected returns, 0.5%, understates significantly the evidence on out-performance from previous years (2% - 3%).
- Secondly, Ofgem's approach as set out in its May 2019 decision to limit the impact of any adjustment for outperformance such that the allowed rate of return remains within its CAPM calculated range irrespective of the assumed level of outperformance risks over-rewarding shareholders
- Ofgem should consider formalising the adjustment for expected outperformance based on historical levels – we suggest an adjustment equivalent to 50% to ensure allowed returns do not fall below allowed returns and to ensure incentive mechanisms are not reduced.

6.2 Evidence on outperformance

6.2.1 Figure 1 of this report showing expected level of outperformance of regulated companies during RIIO-1 is reproduced below.

Figure 6: Price control outperformance (in terms of RoRE based on Notional Gearing - RIIO-1 period)



Source: Ofgem Regulatory Financial Performance Report Annex

6.2.2 Figure 6 shows that the level of equity outperformance varies across different market segments from 2% to 5%. On a weighted average basis, the difference is 3%.

6.2.3 Absent any evidence to the contrary, it is reasonable to assume that future levels of outperformance will be the same as historical levels, indicating that an adjustment of 3% would be justified.

6.3 Ofgem's working assumption for outperformance

6.3.1 In its December 2018 consultation Ofgem explained that its approach of determining the level of adjustment was essentially one that set its allowed cost of equity to a level at the bottom of its unadjusted range:

> *"As a working assumption at this point in the price control review, we assume an AR of 4% CPIH real, the bottom end of the cost of equity range from Step 2. Thus, in making the distinction between AR and ER the impact on the AR would be a reduction of 50bps from the mid-point of the range. We note this is a relatively small reduction compared to historical outperformances of 200-300bps. This will be re-assessed at initial and final determinations"*[49]

[49] Ofgem, 18 December 2018, *Consultation*, *RIIO-2 Sector Specific Methodology Annex: Finance*, para 3.166

6.3.2 In its May 2019 Decision Ofgem retained its working assumption for an adjustment of 50bps but noted that any final adjustment would be constrained to ensuring an allowed return within its calculation of an expected range for the cost of capital:

> *"We will propose an allowed return on equity at draft determinations that reflects our estimation of: a) the cost of equity; and b) expected (out- or under-) performance for RIIO-2, insofar as the AR remains within the bounds of our estimate of the cost of equity range. Ultimately, we may estimate an expectation of zero for (out- or under-) performance."*[50]

6.3.3 It is not clear why Ofgem considers it necessary to make such a small adjustment given the historical levels of out-performance or to constrain its allowed return to a range based on an assumption which yields a higher return than necessary.

6.3.4 We recommend that Ofgem considers a more formulaic, predictable adjustment based on historical levels of outperformance or market-asset ratios. By way of example this could be as simple as formalising the adjustment as a proportion (say 50%) of any out-performance in the previous charge control. On this basis an adjustment for expected outperformance of 1.5% (i.e. 50% of 3%) would be reasonable.

6.3.5 It would be reasonable to allow for an adjustment of only a proportion of the outperformance in previous periods to

a. avoid the risk of reducing expected returns to a level below the allowed return as a result of this adjustment (i.e. in case investors did not expect future levels of outperformance to equal historical levels)
b. ensure that companies remain incentivised to seek out efficiencies over time and reduce costs.

[50] Ofgem, 24 May 2019, *RIIO-2 Sector Specific Methodology Decision – Finance* paragraph 3.300.