



Market-to-asset ratios as a cost of equity cross-check

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Executive summary

In this report, on behalf of the Energy Networks Association (ENA), we assess the appropriateness of using market-to-asset ratios (MARs) as a cross-check to the allowed return on equity.

Ofgem explains that it observes companies being traded at a premium to the regulatory asset base (RAB) and suggests that the premium must be driven by a combination of two factors: the expected outperformance and the deviation of the required return on equity from the return on equity allowance. However, as long as investors have sticky expectations and believe that MARs will stay approximately at the current level (i.e. above 1x), they can assume a terminal value of above 1x MAR. A terminal value of above 1x explains a significant proportion of the premium paid above RAB at investment and reduces the weight that Ofgem should put on the potential outperformance or the difference between required and allowed return on equity.

Using MARs estimated with reference to the equity data for the UK pure-play regulated networks as well as energy and water transactions data, in this report, we assess the sensitivity of MARs to regulatory determinations and recent outperformance. We use the headroom between the allowed risk-free rate and index-linked gilts (ILGs) and the headroom between the allowed cost of equity and ILGs as a proxy for whether the cost of equity allowance is set at a challenging level. To measure performance, we use return on regulated equity (RoRE). While Ofgem's cross-check assumes a causal link between returns and MARs, our assessment shows no clear link between them. Instead, we find investors' expectations to be sticky, i.e. fluctuating within and around the same range of MARs over an extended period of time. These findings show that the MARs evidence is inconclusive, and therefore is not sufficiently robust to be used to inform Ofgem on whether the level of the cost of equity allowance is set too high or too low.

Given the weak relationship between the premium and the deviation of the allowed return on equity from the required return on equity, there is little constraint on how far a regulator could reduce the allowed return on equity based on observing a premium—the regulator may observe MARs above 1x and adjust the allowed return on equity downwards in a few consecutive price control reviews.

In addition, there does not appear to be a sound theoretical basis for Ofgem to use MARs in setting the regulatory allowances. This is because, in a competitive market, higher transaction values or market capitalisations would not mechanistically lead to lower revenues, and nor should they mechanistically lead to lower regulated return allowances.

The premium that investors are prepared to pay is reflective of their long-term expectations about the price at which they will be able to sell the asset. It takes more than one regulatory determination to create a trend that breaks the link between the historical MARs levels and the premium investors pay today. However, once it is broken, the part of the premium that corresponds to this factor could fall sharply as investors revise down their long-term cash flow forecasts. The decline in valuations would be exacerbated if external investors also increased the risk premium required to invest capital into the industry. This risk premium would be expected to persist at least until the next price control review, which would be the first opportunity to start to restore confidence in the regime which may be challenging and/or costly to restore. The effect, however, would be mitigated by other factors explaining MARs above 1x, such as the winner's curse, the value of non-regulated business activities, adjustments as reconciliations from the preceding price control, and other factors.

1 Introduction

- 1.1 In its RIIO-ED2 Draft Determinations for electricity distribution networks, and its RIIO-GD2/T2 Final Determinations for transmission and gas distribution networks, Ofgem uses market-to-asset ratios (MARs) as a cross-check to its cost of equity estimate based on the capital asset pricing model (CAPM). In this report, we assess the appropriateness of this cross-check on behalf of the Energy Networks Association (ENA).
- 1.2 Ofgem explains that it observes that UK utilities are trading at a premium to the regulatory asset base (RAB), i.e. with a MAR above 1x, and that the premium must be driven by a combination of two factors: the expected outperformance and the deviation of the investors' assumed cost of equity from the return on equity allowance.¹ Ofgem accepts that it is impossible to separate the impact of the two factors and refers to this issue as the 'joint hypothesis problem'. At the same time, Ofgem notes that if the true cost of equity is assumed to be at the level of Ofgem's CAPM-based estimate, one has to assume an unrealistically high level of outperformance. Based on this, Ofgem interprets evidence on MARs as suggesting that the CAPM overestimates the true cost of equity and that the return on equity allowance should be adjusted downwards.²
- 1.3 The issue has been discussed extensively at the RIIO-2 appeals to the Competition and Markets Authority (CMA)—the networks disagreed with Ofgem as regards its interpretation of the evidence proposed by MARs.³
- 1.4 For example, based on our previous assessments, we have identified a number of factors that can explain an observed level of MARs above 1x without assuming that the investors' required cost of equity is below the regulatory allowed CAPM-based estimate. These include:⁴

¹ Ofgem (2021), '[Decision - RIIO-2 Final Determinations – Finance Annex \(REVISED\)](#)', 3 February, 3.119.

² Ibid., para. 3.121.

³ CMA (2021), CMA (2021), '[Cadent Gas Limited, National Grid Electricity Transmission plc, National Grid Gas plc, Northern Gas Networks Limited, Scottish Hydro Electric Transmission plc, Southern Gas Networks plc and Scotland Gas Networks plc, SP Transmission plc, Wales & West Utilities Limited vs the Gas and Electricity Markets Authority. Final determination. Volume 2A: Joined Grounds: Cost of equity](#)', 28 October.

⁴ Oxera (2021), '[National Grid's acquisition of WPD from PPL and the simultaneous sale of NECO to PPL](#)', 10 May. Oxera (2020), '[What explains the equity market valuations of listed water companies?](#)', 20 May.

- company-specific outperformance on financing and tax, outcome delivery incentives (ODIs), TOTEX, and fast-track status (for water networks under Ofwat's regulatory regime);
 - expected RAB growth, which strengthens the impact of outperformance;
 - the value of non-regulated business activities, which is additional to the value generated by the RAB;
 - synergy-related cost savings where multiple assets are held, which could create value outside of the target asset;
 - adjustments required due to the network transaction being a part of a wider exchange of assets;
 - accrued dividends, which are likely to be embedded into the market capitalisation of a company and need to be adjusted for;
 - a RAB exit multiple as the terminal value.
- 1.5 Other qualitative considerations that can explain how MARs could exceed 1x without the regulated cost of equity allowance being higher than the true cost of equity include:⁵
- the winner's curse—the winning bid on a transaction is the one with the highest valuation, which often happens to be above the intrinsic asset value;⁶
 - a control premium—in a competitive process, investors are willing to pay a premium for a majority stake in a business;
 - financial restructuring—there is the potential to restructure the financing of the business and create value for the shareholders;
 - revenue and/or RAB adjustments as reconciliations from the preceding price control;
 - environmental, social and governance (ESG) factors and market sentiment.

⁵ Oxera (2021), 'National Grid's acquisition of WPD from PPL and the simultaneous sale of NECO to PPL', 10 May, section 3.5.

⁶ See, for example, Andrade G., Mitchell M., and Stafford E. (2001), 'New Evidence and Perspectives on Mergers', *Journal of Economic Perspectives*, spring, 15:2.

- 1.6 While the CMA has not agreed with the appellants that 'little to no inference could be taken from MAR premiums',⁷ we consider that insufficient attention has been paid to the topic of the terminal value or exit multiple, which is an area of focus in this report (see section 2). In particular, as long as investors have sticky expectations and believe that MARs will stay approximately at the current level (i.e. above 1x), they can assume a terminal value of above 1x MAR. A terminal value of above 1x explains a significant proportion of the premium paid above RAB at investment and reduces the weight that Ofgem should put on the potential outperformance or the difference between required and allowed return on equity. Other factors, such as the winner's curse, the value of non-regulated business activities, or adjustments as reconciliations from the preceding price control still play a role.
- 1.7 In addition, based on the evidence on the stickiness of investors' expectations provided in section 2, we discuss why we do not consider MARs to be an appropriate regulatory tool for setting allowances in section 3.

⁷ CMA (2021), '[Cadent Gas Limited, National Grid Electricity Transmission plc, National Grid Gas plc, Northern Gas Networks Limited, Scottish Hydro Electric Transmission plc, Southern Gas Networks plc and Scotland Gas Networks plc, SP Transmission plc, Wales & West Utilities Limited vs the Gas and Electricity Markets Authority. Final determination. Volume 2A: Joined Grounds: Cost of equity](#)', 28 October, para. 5.686.

2 Relative stability of market-to-asset ratios and the terminal value

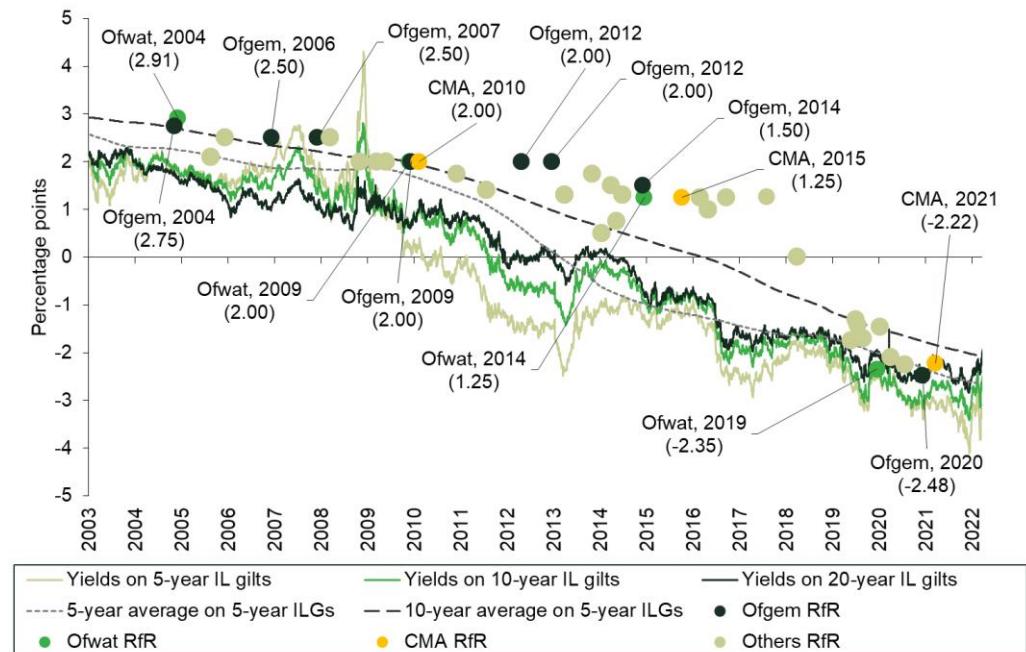
- 2.1 In this section, we explain that paying a premium above the RAB can be sensible for investors, irrespective of recent regulatory determinations or recent operational performance (see section 2A), if the payment of a premium is consistent with market expectations.
- 2.2 We then present supporting evidence—showing that there is no clear correlation between MARs and regulatory determinations (see section 2B) as well as between MARs and recent operational performance (see section 2C), and, therefore, that the premium should not be explained by those.
- 2A Terminal value in line with market expectations as a sufficient reason to pay a premium**
- 2.3 The hypothesis tested in this report is that investors have persistent expectations in relation to the top-down ‘market rate’ for a premium to the RAB. This expectation can support their assumptions around a terminal value in excess of the RAB. MARs of energy and water networks have been above 1x for a number of years (see section 2B), therefore, it is reasonable to assume that investors use a MAR above 1x as a terminal value, even when using the DCF modelling as primary evidence.
- 2.4 It could be argued that a MAR above 1x used as a terminal value is equivalent to assuming perpetual outperformance, which is unrealistic, or that it implies a perpetual difference between the required and allowed cost of equity. This may or may not be how investors make assumptions about the terminal value, what matters is that those long-term assumptions, which drive valuation, do not have to be linked to the short-term performance or regulatory allowances. In other words, if investors always expect to pay more than the RAB to be successful acquirers in a transaction, for example, then this sticky expectation decouples the terminal value from current expectations of network performance and the level of regulatory allowances.
- 2.5 The same phenomenon is observed in the market prices of some assets that do not generate cash flows, such as gold or Bitcoin. Investors cannot value these assets based on discounting an income stream, as the only way to generate cash from those assets is to resell them. In these cases, investors have to use the market value and expectations of future market value, as a benchmark for the price that they are prepared to pay today.

2B MARs do not change immediately with regulatory determinations

- 2.6 In this subsection, we present evidence showing MARs' relative insensitivity to regulatory determinations. We focus on the networks regulated by Ofgem (as the most relevant regulator) and Ofwat (to broaden the sample to a regulator that sets allowances at broadly similar levels to Ofgem).
- 2B.1 Measuring the level of challenge implied by the allowed return on equity**
- 2.7 To measure how challenging the allowed return on equity is, we compare regulatory risk-free rate allowances and yields on index-linked gilts (ILGs). This measure is a proxy; the difference between ILGs and the risk-free rate allowance is observable and is a driver of changes in how challenging the regulated cost of equity allowance is perceived to be.⁸
- 2.8 In addition to the difference between regulatory risk-free rate allowances and ILGs, we conducted the analysis using the difference between the regulatory cost of equity allowance and ILGs as a proxy for how challenging the allowed return on equity is. In Appendix A1, we show that our findings are robust to change. The difference between the regulatory cost of equity allowance and ILGs controls for interest rate movements and captures variation in the risk premium part of the allowed cost of equity. This measure also varies with notional gearing, although, we have not controlled for that for the sake of simplicity.
- 2.9 Figure 2.1 shows the evolution of regulatory risk-free rate allowances set by Ofwat, Ofgem, and other UK regulators, in comparison with ILGs of different maturities. While the regulatory risk-free rate allowances are typically above ILGs, the difference between the two series is particularly pronounced during the period from 2010 to 2018. During this period, a few risk-free rate allowances by Ofwat and Ofgem were set approximately between 1% and 2%, while ILGs declined significantly to less than 0%, causing the gap between spot rates and allowances to widen for the regulated companies. From 2019 onwards, regulators aligned risk-free rate allowances with ILGs at their negative levels (in RPI-real terms).

⁸ Note that, with this analysis, we do not represent spot yields on ILGs as the most appropriate measure of the regulated risk-free rate allowance—evidence submitted in recent price control appeals indicates that setting the regulatory risk-free rate equal to yields on ILGs will underestimate the risk-free rate as defined for use in the Capital Asset Pricing Model (CAPM).

Figure 2.1 Risk-free rate regulatory allowance and UK government index-linked gilts, RPI-real (%)

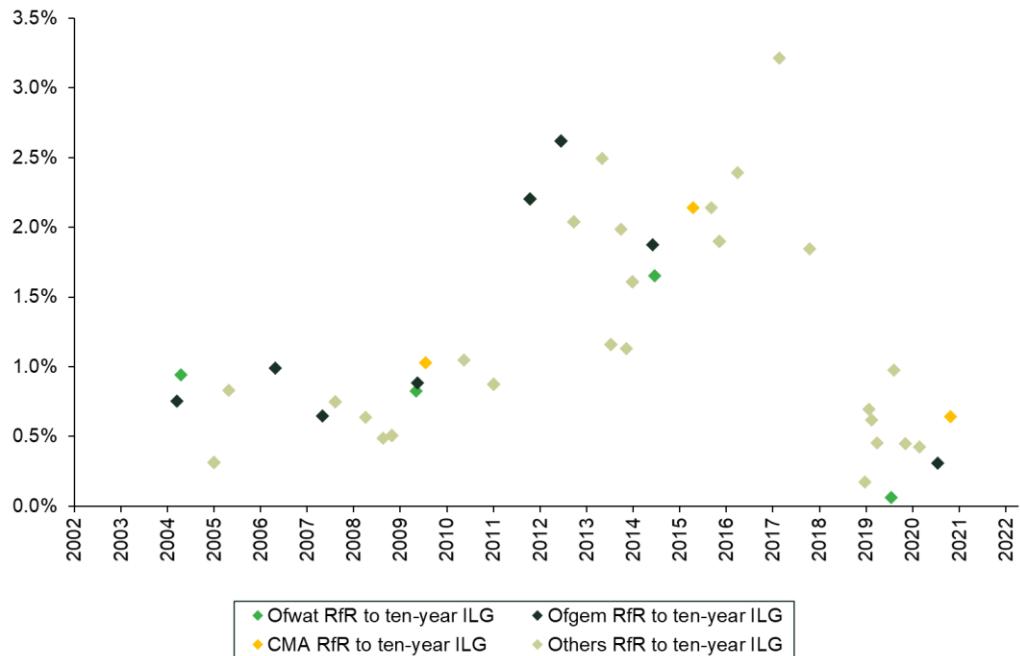


Note: Other regulatory bodies include the UR for energy and water in Northern Ireland, Ofcom for telecoms, the CAA for aviation, the ORR for rail, and the CMA and its predecessor, the Competition Commission, when not applicable to Ofwat or Ofgem determinations. In particular, the CMA decisions under the 'Other' category cover decisions on the Economic Regulation of Stansted Airport in 2009 (as Competition Commission), the Northern Ireland Electricity price determination in 2014 (as Competition Commission), and the NERL RP3 price control in 2020. The CMA decisions that are relevant for regulated water and energy companies (highlighted in yellow) include the Bristol Water price determination in 2010 (as Competition Commission), the Bristol Water price determination in 2015, and the PR19 appeal price determinations in 2021. The chart shows only final decisions by Ofwat, Ofgem and the CMA. RfR—risk-free rate.

Source: Oxera based on regulatory determinations.

- 2.10 Figure 2.2 shows the difference between risk-free rate allowances and a one-year average of ten-year ILGs preceding the allowances. This figure also shows the increase in the headroom between regulated risk-free rate allowances relative and the current yields in the period from 2010 to 2018.

Figure 2.2 Difference between risk-free rate allowances and one-year averages of ten-year ILGs



Note: Other regulatory bodies include the UR for energy and water in Northern Ireland, Ofcom for telecoms, the CAA for aviation, the ORR for rail, and the CMA and its predecessor, the Competition Commission, when not applicable to Ofwat or Ofgem determinations. In particular, the CMA decisions under the 'Other' category cover the decisions on the Economic Regulation of Stansted Airport in 2009 (as Competition Commission), the Northern Ireland Electricity price determination in 2014 (as Competition Commission), and the NERL RP3 price control in 2020. The CMA decisions relevant for regulated water and energy companies (highlighted in yellow) include the Bristol Water price determination in 2010 (as Competition Commission), the Bristol Water price determination in 2015, and the PR19 appeal price determinations in 2021. The chart shows only final decisions by Ofwat, Ofgem and the CMA. RfR—risk-free rate.

Source: Oxera based on regulatory determinations.

- 2.11 Assuming that the allowed and required costs of equity would, to some extent, follow the movement of the allowed and observed risk-free rate benchmarks,⁹ we can test whether those movements have an impact on MARs—and in particular, whether the MARs would increase with an increase in the headroom between the risk-free rates and ILGs, and whether such changes would explain the observed level of MARs.
- 2.12 In the following subsections, we present the MARs analysis of United Utilities and Severn Trent (for most of the historical period these were the only listed

⁹ For companies with an equity beta less than one, such as utilities, the cost of equity will reduce as the risk-free rate declines, even if the total market return is relatively stable.

regulated pure-play utilities in the UK),¹⁰ estimated with reference to their stock market value (hereafter ‘traded MARs’). We then present the MARs analysis with reference to transaction values (referred to as ‘transaction MARs’).

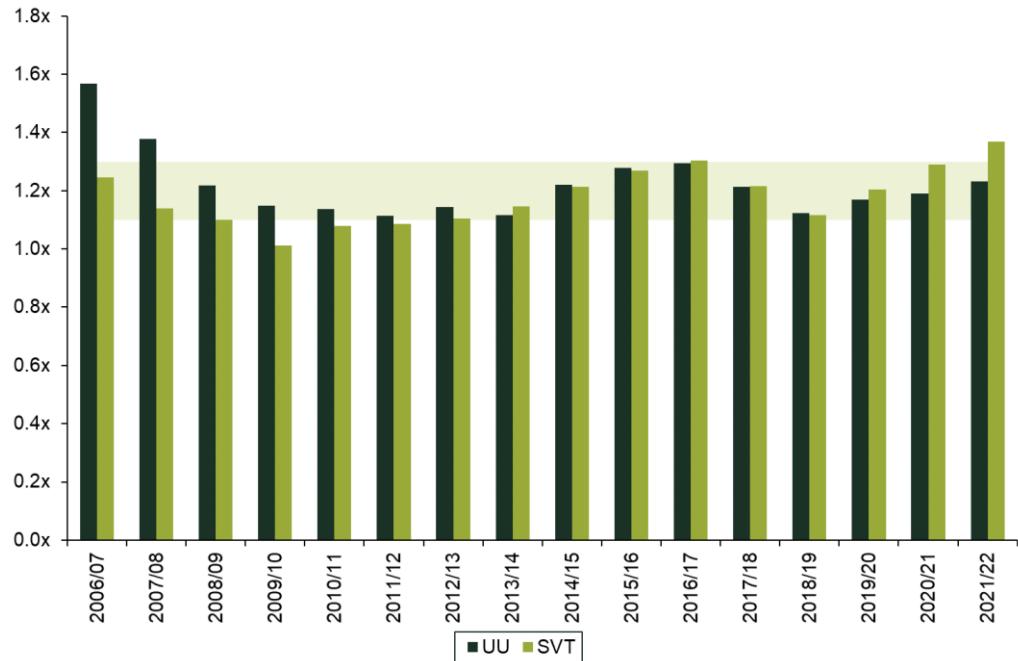
2B.2 Stable trading multiples despite changes in the risk-free rate allowance relative to ILG yields

- 2.13 Figure 2.3 shows annual traded unadjusted MARs for United Utilities and Severn Trent. The market value (the numerator) is estimated as the annual average market capitalisation plus an average of the opening and closing book value of net debt; and the RCV value (the denominator) is estimated as an average of opening and closing RCV for that year.¹¹ Note that we present unadjusted MARs, i.e. we do not adjust for such factors as company-specific outperformance, a fast-track status or the value of non-regulated businesses. Undertaking these adjustments may increase the precision of the analysis. However, since in this report we focus on the trends rather than levels and assess the correlation of the MARs with recent outturn performance separately (in section 2C), we consider the analysis to be robust without undertaking such adjustments.
- 2.14 The figure shows that, for both companies, MARs in most years have been fluctuating within a range from 1.1x to 1.3x. It could be argued that relatively high MARs in 2015–17 are reflective of less challenging Ofwat determinations in 2014, as proxied by the headroom between the risk-free rate and ILGs (see Figure 2.1) but such a relationship is not conclusively borne out by the data because, for example, the MARs in 2009–12 were relatively low, although the risk-free rate ‘headroom’ in those years was similar to that in the years before. Similarly, MARs increased in 2019/20, even though starting from that time, there was no risk-free rate ‘headroom’ relative to ILGs.
- 2.15 Specifically, we observe some cyclicalities in the MARs values, moving from lows in the years 2010–13 to highs in 2014–18, followed by the same pattern again. When compared with the headroom in the allowed risk-free rate and the ILGs rates, the MARs ratio appears to have an uncorrelated pattern, which cannot be explained solely by the gap between allowed and observed returns.

¹⁰ Other UK listed utilities, including Pennon Group, National Grid and SSE, have or had a significant proportion of non-UK-regulated businesses.

¹¹ We have checked that the results are not sensitive to the choice of whether to use an average of opening and closing balances or only the opening balance, as the latest available actual balance during the year.

Figure 2.3 Traded unadjusted MARs of United Utilities and Severn Trent



Source: Oxera, based on data from Bloomberg, companies' annual accounts and Ofwat.

- 2.16 Figure 2.4 shows the traded MARs of United Utilities and Severn Trent and the spread between the risk-free rate allowance set by Ofwat and one-year averages of ILG rates preceding the allowance determinations. The chart confirms the previous observation of an uncorrelated pattern between traded MARs and the risk-free rate headroom.

Figure 2.4 Traded MARs and the difference between allowed risk-free rate and ILGs



Source: Oxera, based on data from Bloomberg, companies' annual accounts and Ofwat.

2.17 Overall, we do not consider the MARs fluctuations to be reflective of the trends in the difference between the allowed risk-free rate and ILGs, and, by extension, with the level of challenge assumed by the allowed return on equity.

2B.3 Transaction multiples also remain consistently above 1x

2.18 In addition to the traded MARs, we draw on the evidence from the transaction MARs, calculated as a ratio of enterprise values derived from transactions and networks' RAB values. It is important to note that the details of a transaction are not usually publicly disclosed and that the information available cannot always be cross-checked using different sources. Therefore, to render the MARs analysis informative and less distortive, we apply some filtering criteria to select the most reliable set of evidence. Box 2.1 describes how we have filtered transactions and estimated the MARs.

Box 2.1 Transaction MARs—methodology

Filtering

To select relevant transactions, we retrieved data from Dealogic with the following specifications:

- target location: United Kingdom;

- sector specification: utilities and energy;
- timing of completion: 2003 to 2022.

Then, we selected transactions related to regulated water and energy network companies in Great Britain. We identified 52 transactions.

As the next filtering step, we controlled for the size of the asset and the stake of the transaction to ensure that transactions would be broadly comparable.

- We controlled for the size of the asset, as a premium on a large asset may be perceived differently by investors from the same premium (in percentage terms) on a small asset due to behavioural biases. Therefore, we kept only transactions related to companies with a nominal RAB larger than a certain threshold. We set the threshold between a South East Water transaction in 2010 with a contemporaneous RAB of £843m, which is still in the sample, and a Bristol Water transaction in 2021 with a contemporaneous RAB of £551m. As a result, we excluded a few transactions related to small water-only companies,¹ which are considerably smaller than all GB energy networks—an energy network transaction with the smallest RAB in the sample was a Wales & West Utilities transaction in 2012 with a RAB of £1,793m at the time. This led to the exclusion of 22 transactions.
- We controlled for the ownership stake, as transaction values could be affected by control premia. We kept transactions with a stake at or larger than 25%. This led to the exclusion of 8 transactions.

This resulted in a sample of 22 transactions from 2003 to May 2022; the detailed dataset is included in Appendix A2.

Data sources and estimation methodology

We made the following methodological choices when estimating the MARs.

- We used Dealogic as a source for the information on stake size after acquisition, transaction value at announcement, and enterprise value at announcement.
- We took the latest available actual RAB at the time of the transaction, i.e. the closing value of the previous financial year, from the companies' annual reports and Ofwat or Ofgem data. This resulted in MAR estimates that were conservatively higher than estimates based on forecast RAB (at the end of the relevant year).
- When non-regulated business values were disclosed, we excluded them from the enterprise value used in the MAR estimation.
- We used book value of net debt and adjusted it for outstanding pension liabilities.
- We adjusted the RAB of Western Power Distribution by the cash premium paid in the NECO acquisition.²

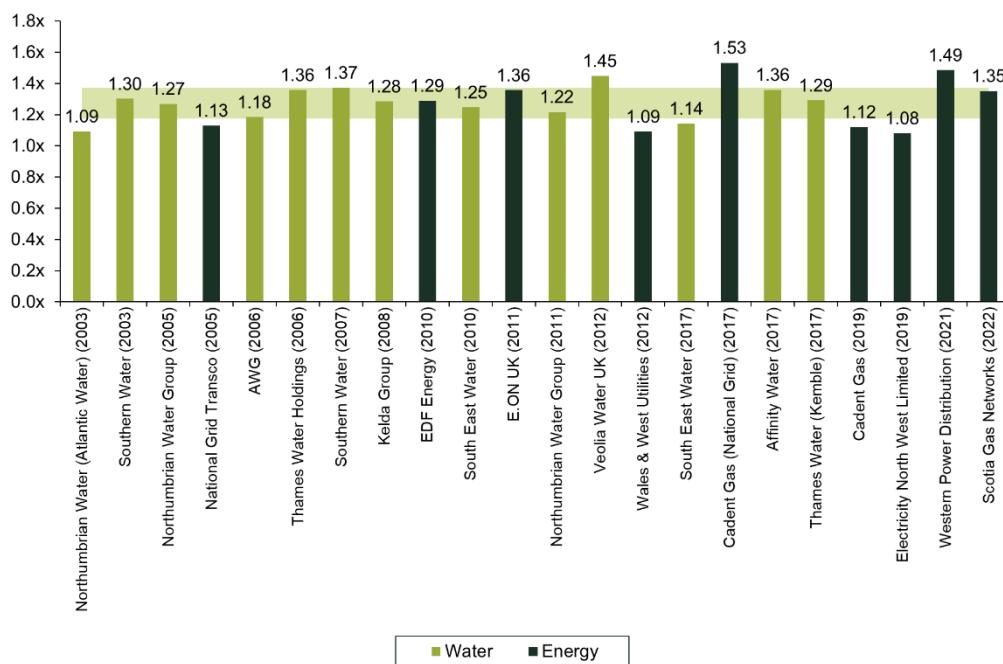
Note: ¹ Our selection procedure related to the size of the RAB led to the exclusion of transactions for Bristol Water, South East Water (although we included later transactions when

the company's RAB was larger), South Staffordshire Water, Summit Water, Sutton & East Surrey Water, Swan Group, Bournemouth Water, Portsmouth Water, Dee Valley Water, and Cambridge Water.² We previously estimated it to be £1,364m. See Oxera (2021), 'National Grid's acquisition of WPD from PPL and the simultaneous sale of NECO to PPL', 10 May.

Source: Oxera analysis.

- 2.26 Figure 2.5 shows transaction MARs for our final sample. Since 2003, transaction MARs have been fluctuating in a range of 1.1–1.5x. Notably, there is no upward trend in the MARs between 2010 and 2018 that would mimic an increasing 'headroom' between the risk-free rate allowance and the market ILGs.

Figure 2.5 Transaction MARs of GB water and energy networks



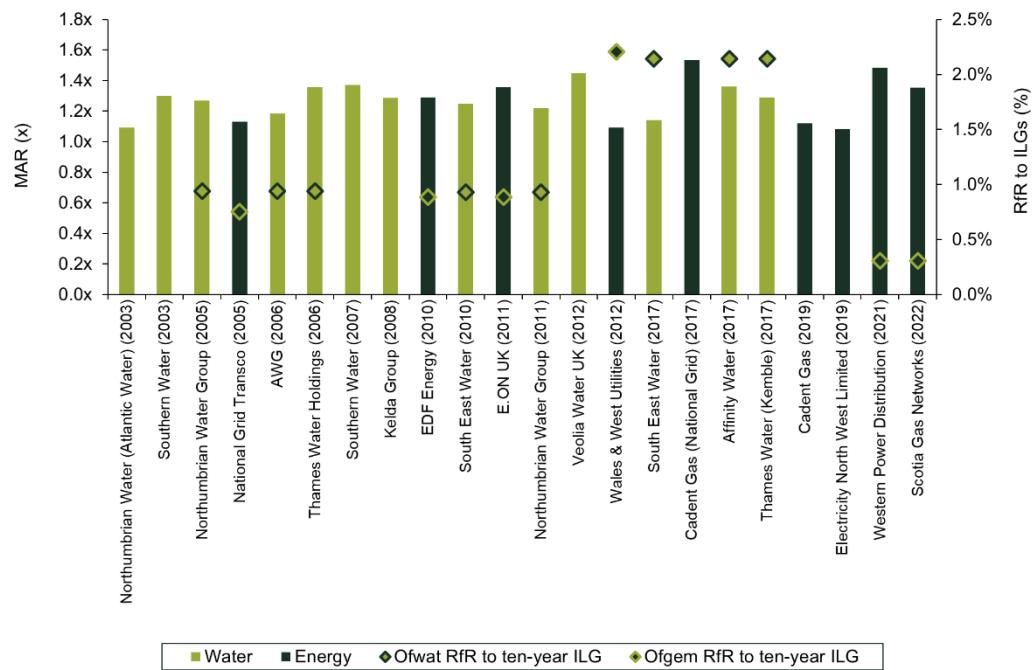
Source: Oxera analysis, based on data from Dealogic.

- 2.27 Figure 2.6 combines transaction MARs of GB water and energy networks and the difference between risk-free rate allowances set by Ofwat or Ofgem within two years before the transaction and ILGs.¹²
- 2.28 The higher MARs in post-2019 transactions—when allowances were more challenging (as proxied by the risk-free rate headroom against ILGs)—show that there is no correlation between the MARs level and the level of the allowance headroom.

¹² As for the traded MARs, we use a one-year historical average ILG yields. A two- rather than one-year window is chosen for the preceding determinations to increase the number of determinations in the sample.

- 2.29 These results support our hypothesis that, instead of reacting instantly to regulatory determinations, investors anchor their willingness to (over-)pay on previous transaction prices, resulting in consistently high acquisition prices relative to RAB values.

Figure 2.6 Transaction MARs and the difference between ILGs and the allowed risk-free rate set within two years before the transaction



Note: The figure reflects only those determinations published within a two-year window before the transaction. Since the risk-free rate allowance has not been set by Ofwat or Ofgem for all transactions within the last two years, we do not show the risk-free rate headroom for all of them. If there are multiple determinations within the two-year period, we take an average of the allowances. Three relevant CMA determinations are included under Ofwat—these are the Bristol Water price determination in 2010 (as Competition Commission), the Bristol Water price determination in 2015, and the PR19 appeal price determinations in 2021.

Source: Oxera analysis, based on data from Dealogic, Ofwat and Ofgem.

- 2.30 In its Final Determination on the RIIO-GD2/T2 appeals, the CMA commented on the impact of the latest regulatory determinations—that the evidence on recent transactions with high MARs is inconsistent with the networks' arguments about determinations being relatively 'tough'.

More broadly, the appellants had argued that RIIO-2 presented a 'tough' package in the round [...] We noted, however, that the two most recent large premium transactions had occurred after the announcement of the respective price control regimes (RIIO-2 in the case of National Grid buying WPD and the CMA PR19 Redetermination in the case of Pennon buying Bristol Water). This made it even more difficult to accept the appellants' assessment that large MAR premiums can

be justified by assumptions other than higher than required allowed returns or lengthy and consistent expected outperformance.¹³

- 2.31 However, as explained above, we consider that recent MARs evidence supports our hypothesis that MARs are relatively insensitive to the latest regulatory determinations.
- 2.32 The CMA also suggested that one should observe a ‘buyers’ strike’, i.e. no transactions following challenging regulatory determinations.

By the appellants’ own logic, we would expect a cost of equity allowance that was materially too low to lead to a ‘buyers strike’ – with no deals evident in the relevant sectors, rather than the series of transactions conducted at significant premiums that has been observed.¹⁴

- 2.33 Our explanation for not observing the ‘buyers’ strike’ is the ‘stickiness’ in investors’ beliefs and the weight of the terminal value. MARs have been above 1x for a number of years. Regulators set challenging determinations, however, investors still form their long-term expectations (which matter the most) based on the past, and therefore investors are ready to pay a premium despite recent regulatory developments.

2C MARs do not accurately reflect companies’ recent performance

- 2.34 In this section, we assess whether MARs are correlated with the latest network performance as measured by the return on regulated equity (RoRE). Since Ofwat and Ofgem started publishing RoRE data systematically from AMP6 and RIIO-1 respectively, we limit our analysis to those periods. It might also be insightful to control for the expected rather than outturn performance—however, outturn performance is inherently uncertain so RoRE data is the only robust data available for this analysis.¹⁵
- 2.35 Figure 2.7 and Figure 2.8 show traded MARs relative to RoRE, net of the allowed return on equity to reflect companies’ out- or underperformance, for United Utilities and Severn Trent respectively. In each year, we represent a

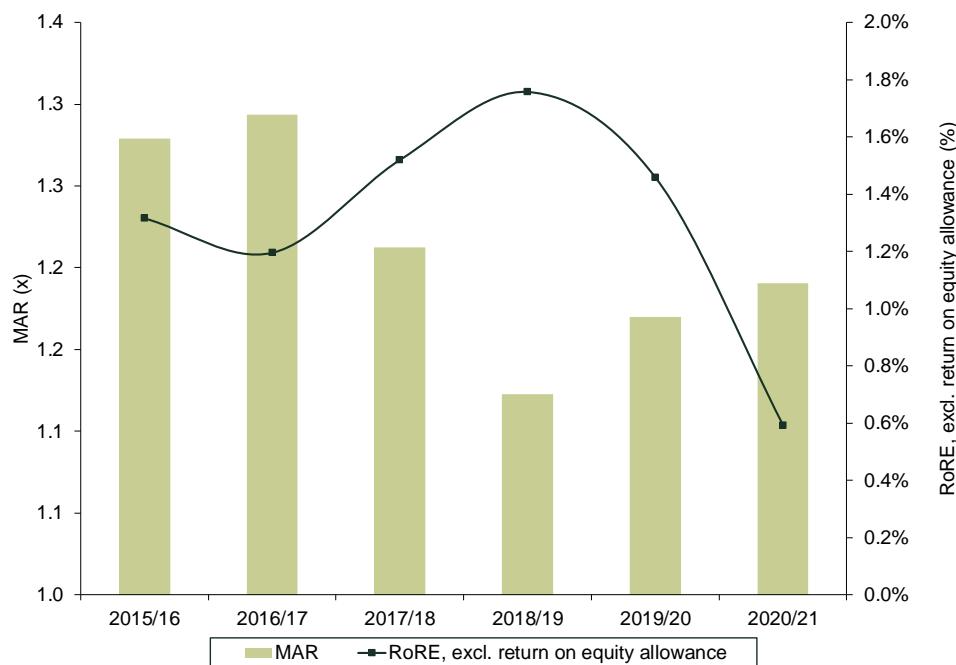
¹³ CMA (2021), ‘Cadent Gas Limited, National Grid Electricity Transmission plc, National Grid Gas plc, Northern Gas Networks Limited, Scottish Hydro Electric Transmission plc, Southern Gas Networks plc and Scotland Gas Networks plc, SP Transmission plc, Wales & West Utilities Limited vs the Gas and Electricity Markets Authority. Final determination. Volume 2A: Joined Grounds: Cost of equity’, 28 October, para. 5.684.

¹⁴ CMA (2021), ‘Cadent Gas Limited, National Grid Electricity Transmission plc, National Grid Gas plc, Northern Gas Networks Limited, Scottish Hydro Electric Transmission plc, Southern Gas Networks plc and Scotland Gas Networks plc, SP Transmission plc, Wales & West Utilities Limited vs the Gas and Electricity Markets Authority. Final determination. Volume 2A: Joined Grounds: Cost of equity’, 28 October, para. 5.706.

¹⁵ Ofgem also publishes expected RoRE until the end of the ongoing price control period. However, Ofwat publishes only outturn data.

cumulative RoRE since the start of the price control. The figures demonstrate no correlation between MARs and RoRE volatility.

Figure 2.7 United Utilities' traded MARs relative to RoRE



Note: For 2015–20, we use Ofwat's published average RoRE since the beginning of the price control period, i.e. since 2015/16. RoRE for 2021/22 reflects an individual year. The methodology for estimating traded MARs is described in section 2B.3.

Source: Oxera analysis, based on data from Bloomberg and Ofwat, [‘Monitoring financial resilience’](#).

Figure 2.8 Severn Trent's traded MARs relative to RoRE

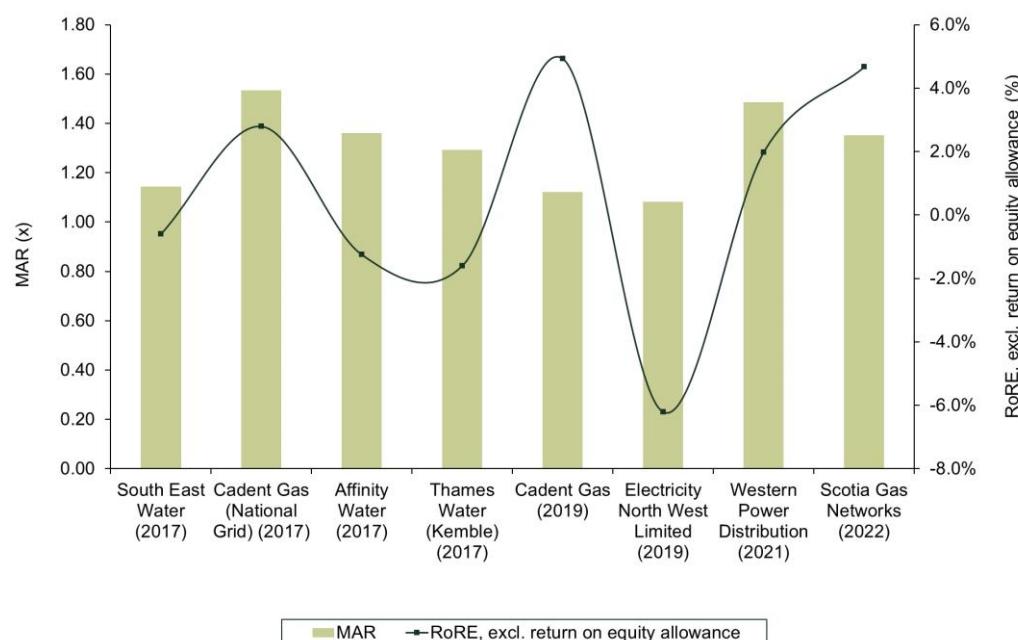


Note: For 2015–20, we use Ofwat’s published average RoRE since the beginning of the price control period, i.e. since 2015/16. RoRE for 2021/22 reflects an individual year. The methodology for estimating traded MARs is described in section 2B.3.

Source: Oxera analysis, based on data from Bloomberg and Ofwat, ‘[Monitoring financial resilience](#)’.

2.36 Similarly, Figure 2.9 shows transaction MARs together with the companies’ recent performance—in each year, we represent a cumulative RoRE, net of the allowed return on equity, since the start of the price control.

Figure 2.9 Transaction MARs relative to RoRE



Note: For water network transactions in 2015–20, we use Ofwat’s published average RoRE since the beginning of the price control period, i.e. since 2015/16. For consistency, we average Ofgem’s published annual RoRE from the beginning of the corresponding price control period, i.e. from 2015/16 for electricity distribution companies and from 2013/14 for gas distribution companies. For each transaction, we use RoRE for the financial year, for which the latest actual data is available.

Source: Oxera analysis, based on data from Dealogic, Ofwat, ‘[Monitoring financial resilience](#)’ and Ofgem (2022), ‘[Regulatory Financial Performance annex to RIIO-1 Annual Reports 2020-21](#)’, 4 July.

3 Are MARs an appropriate source of evidence for determining the allowed return on equity?

- 3.1 In section 2, we provided evidence showing that investors have sticky expectations and can reasonably expect MARs to stay at approximately the current level (i.e. above 1x). Based on that, they can assume a terminal value corresponding to a MAR above 1x, reducing the weight Ofgem should attribute to outperformance or the difference between required and allowed cost of equity.
- 3.2 In this section, we conclude by outlining why we do not consider MARs to be an appropriate regulatory tool for setting allowances and why using MARs to make changes in the levels of the allowed regulated cost of equity could lead to negative outcomes in the long term.

3A How should the regulator use the MARs data?

- 3.3 In addition to the evidence on MARs being inconclusive and therefore not sufficiently robust to be used to inform the level of the cost of equity allowance, as demonstrated above, there does not appear to be a sound theoretical basis for Ofgem to use MARs in setting regulatory allowances. This is because the link that Ofgem makes between a MAR above 1x and the level of revenues a company would subsequently earn (as a consequence of Ofgem adjusting the cost of equity allowance) would not be observed in a competitive market.
- 3.4 Specifically, we observe that in a competitive market, companies' valuations do not affect the equilibrium price of the product, at least in the short term. In the longer term, a change of ownership may lead to operational or financial outperformance; if rival firms respond to observed outperformance by new entry or by seeking to deliver similar levels of efficiency, the equilibrium price may decline over time. This is similar in regulated settings where incentive-based regulation is undertaken—over time, operational or financial outperformance is observed and shared with customers. However, transaction values or market capitalisations would not mechanistically lead to lower revenues in a competitive market, and nor should they mechanistically lead to lower regulated returns.

3B What happens if the regulator overcorrects for the alleged discrepancy between the required and allowed return?

- 3.5 Networks often highlight to their regulators that the harm of setting allowances too low is greater than the harm of setting them too high due to the risks of

service quality deterioration, asset sweating, lack of innovation, or costly procedures of special administration in extreme scenarios. MARs provide another useful illustration of this.

- 3.6 Investors' long-term expectations about the terminal value of their investment are formed over a long period of time and those expectations may not even be correlated with the latest determinations, as explored in section 2 in the context of the decoupling of terminal values from short-term network performance and regulatory allowances. The premium that investors are prepared to pay is reflective of the premia investors see having been paid in the market over many years, which underpins their long-term valuation assumptions.
- 3.7 The recent RIIO-GD2/T2 Determinations as well as the RIIO-ED2 Draft Determinations placed significant weight on MARs evidence, with a potential to justify a reduction in the allowed equity return. At a minimum, Ofgem relied on MARs evidence to assure itself that the allowed equity return was not too low.¹⁶ This disconnects the allowed return on equity from a balanced assessment of the fundamental drivers of the cost of equity. Given the weak relationship between the premium and the deviation of the allowed return on equity from the required return on equity, there is little constraint on how far a regulator could reduce the allowed return on equity based on observing a premium. Following Ofgem's current practice, based on an observed premium, the regulator may want to reduce the allowed rate of return even if the rate has already been set at a relatively challenging level. At the next price control review, the regulator is likely to observe a premium again, because the MARs would not reflect the challenging allowance yet.
- 3.8 It takes more than one regulatory determination to break the link between the historical MARs levels and the premium investors pay today (e.g. investors can assume that a 'harsh' determination will not be followed by future harsh determinations). However, once it is broken, the part of the premium that corresponds to this factor could fall sharply as investors revise down their long-term cash flow forecasts. The decline in valuations would be exacerbated if external investors also increased the risk premium required to invest capital into the industry. This risk premium would be expected to persist at least until

¹⁶ Ofgem (2021), '[Decision - RIIO-2 Final Determinations – Finance Annex \(REVISED\)](#)', 3 February, para. 3.121. Ofgem (2022), '[Consultation - RIIO-ED2 Draft Determinations – Finance Annex](#)', 29 June, para. 3.89.

the next price control review, which would be the first opportunity to start to restore investors' confidence in the regime which may be challenging and/or costly to restore. The effect, however, would be mitigated by other factors explaining MARs above 1x, such as the winner's curse, the value of non-regulated business activities, adjustments as reconciliations from the preceding price control, and other factors.

A1 Allowed return on equity

- A1.1 In this appendix, we show the results of the analysis that we conducted using the difference between the regulatory cost of equity allowance and ILGs as a proxy for how challenging the allowed return on equity is (instead of the difference between regulatory risk-free rate allowances and ILGs used for the analysis described in the main body of the report). The difference between the regulatory cost of equity allowance and ILGs controls for interest rate movements and captures variation in the risk premium part of the allowed cost of equity. This measure also varies with notional gearing, although, we have not controlled for that for the sake of simplicity.
- A1.2 Figure A1.1 shows the traded MARs of United Utilities and Severn Trent and the spread between the return on equity allowance and one-year averages of ILG yields preceding the allowance determinations. The figure confirms that there is no clear correlation between the two metrics—i.e. the conclusions are the same as for the traded MARs and the spread between the risk-free rate allowance and ILGs (see Figure 2.4).

Figure A1.1 Traded MARs and the difference between ILGs and the allowed return on equity

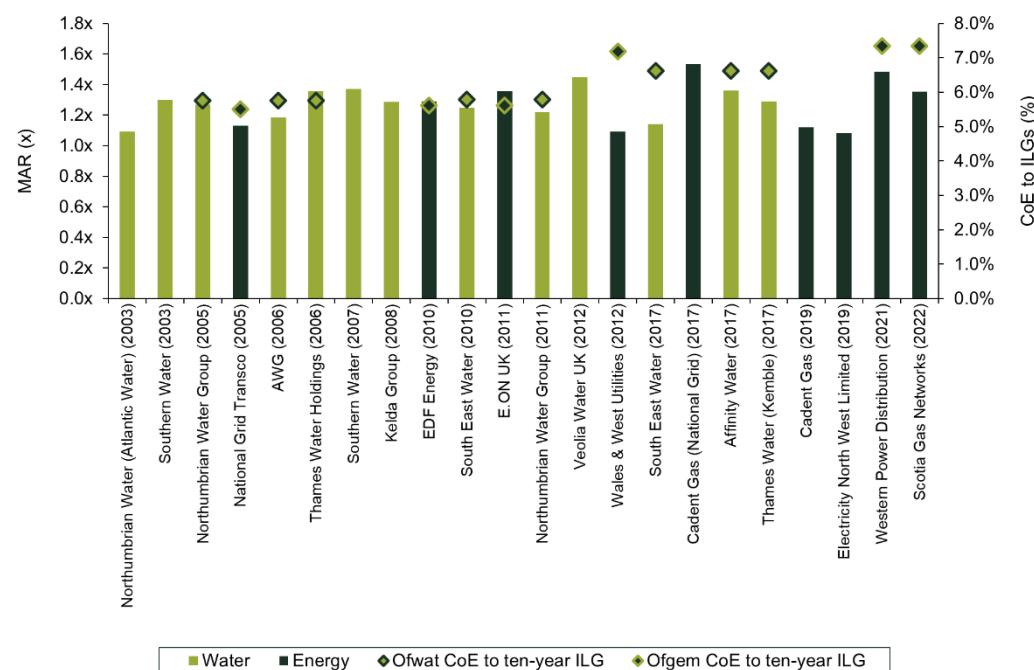


Source: Oxera, based on data from Bloomberg, companies' annual accounts and Ofwat.

- A1.3 Figure A1.2 combines transaction MARs of GB water and energy networks and the difference between return on equity allowances set by Ofwat or

Ofgem within two years before the transaction and ILGs.¹⁷ As per the analysis using the risk-free rate headroom, the figure does not show a clear correlation between the outcomes of the recent determinations and transaction MARs: for example, MARs for the Wales & West Utilities and South East Water transactions in 2017 are in line with or below the preceding ones, while the corresponding determinations are indicated as being less challenging (i.e. the difference between the return on equity allowance and ILGs is greater).

Figure A1.2 Transaction MARs and the difference between ILGs and the allowed return on equity set within two years before the transaction



Note: The figure reflects only the determinations published within a two-year window before the transaction. Since the cost of equity allowance has not been set by Ofwat or Ofgem for all transactions within the last two years, we do not show the cost of equity headroom for all of them. If there are multiple determinations within the two-year period, we take an average of the allowances. Three relevant CMA determinations are included under Ofwat—these are the Bristol Water price determination in 2010 (as Competition Commission), the Bristol Water price determination in 2015, and the PR19 appeal price determinations in 2021.

Source: Oxera analysis, based on data from Dealogic, Ofwat and Ofgem.

- A1.4 The results shown in this appendix support our hypothesis that, instead of reacting instantly to regulatory determinations, investors anchor their willingness to (over-)pay on previous transactions prices, resulting in consistently high acquisition prices relative to RAB values.

¹⁷ As for the traded MARs, we use a one-year historical average ILG yields. A two- rather than one-year window is chosen for the preceding determinations to increase the number of determinations in the sample.

A2 Transactions details

- A2.1 We used the Dealogic database as a primary source of data on transactions. We took the company name, transaction date, stake size and enterprise value from the Dealogic database. We then compared all data with other sources, such as news articles, corporate announcements and annual reports. Where we consider that other sources provide more reliable equity values than the enterprise values from Dealogic, we have based our calculations on those sources. In those cases, we added net debt (net debt derives from short- and long-term loans and borrowings, adding derivative financial instruments, and subtracting financial and other investments, assets held for sale and cash) to the equity value, and adjusted for pension liabilities and assets. We also adjusted the enterprise values for non-regulated business segments, when companies disclose information about them in their annual reports. RAB data comes mainly from annual reports and regulatory documents. We used RAB data consistent with the end of the last financial year preceding the transaction completion date.
- A2.2 Table A2.1 provides the details of the MAR estimates.

Table A2.1 Details on the transactions dataset

Acquired company	Sector	Transaction completion date	Acquired stake	Enterprise value (£m)	RAB (£m)	MAR (x)	Sources and adjustments
Northumbrian Water (Atlantic Water)	Water	23/05/2003	75%	2,373	2,171	1.09	Enterprise value is taken from Dealogic; RAB is from regulatory accounts of financial year 2002/03.
Southern Water	Water	31/05/2003	100%	2,852	2,192	1.30	Enterprise value is taken from Dealogic; RAB is from Ofwat.
Northumbrian Water Group	Water	21/04/2005	25%	3,133	2,468	1.27	Enterprise value is taken from Dealogic; RAB is from the annual report of financial year 2004/05.
National Grid Transco	Energy	01/06/2005	100%	5,756	5,091	1.13	Enterprise value is taken from Dealogic; RAB is from Ofgem.
AWG	Water	23/11/2006	100%	5,329	4,501	1.18	Enterprise value is taken from Dealogic; RAB is from Ofwat.

Acquired company	Sector	Transaction completion date	Acquired stake	Enterprise value (£m)	RAB (£m)	MAR (x)	Sources and adjustments
Thames Water Holdings	Water	01/12/2006	100%	8,000	5,891	1.36	Enterprise value is taken from Dealogic; RAB is from 'A Guide to Understanding Water Company Accounts' from the Consumer Council for Water.
Southern Water	Water	09/10/2007	100%	4,000	2,914	1.37	Enterprise value is taken from Dealogic; RAB is from the annual report of financial year 2006/07.
Kelda Group	Water	08/02/2008	100%	5,140	4,000	1.28	Enterprise value is taken from Dealogic; RAB is from Reuters.
EDF Energy	Energy	29/10/2010	100%	5,275	4,091	1.29	Enterprise value is taken from Dealogic; RAB is from Ofgem. We adjust the enterprise value by £500m non-regulated business value, which is an estimate by the <i>Financial Times</i> .
South East Water	Water	20/12/2010	50%	1,051	843	1.25	Enterprise value is taken from Dealogic; RAB is from Ofwat.
E.ON UK	Energy	01/04/2011	100%	4,000	2,949	1.36	Enterprise value is taken from Dealogic; RAB is from Ofgem.
Northumbrian Water Group	Water	14/10/2011	100%	4,042	3,319	1.22	Equity value is taken from Dealogic; RAB and financial data are from the annual report of financial year 2010/11. We adjust the enterprise value by £34m pension liabilities and £124m non-regulated business value.
Veolia Water UK	Water	28/06/2012	90%	1,373	948	1.45	Enterprise value is taken from Dealogic; RAB is from Veolia's website.
Wales & West Utilities	Energy	16/10/2012	100%	1,957	1,793	1.09	Enterprise value is taken from Dealogic; RAB is from Powerassets.com.
South East Water	Water	09/02/2017	50%	1,333	1,167	1.14	Equity value is taken from Dealogic; RAB and financial data are from the annual report of financial year 2015/16. We adjust the enterprise value by £9m of pension assets and £2m of pension liabilities.

Acquired company	Sector	Transaction completion date	Acquired stake	Enterprise value (£m)	RAB (£m)	MAR (x)	Sources and adjustments
Cadent Gas (National Grid)	Energy	31/03/2017	61%	13,800	9,002	1.53	Enterprise value is taken from Dealogic; RAB is from a bond prospectus of Cadent Gas.
Affinity Water	Water	19/05/2017	90%	1,572	1,156	1.36	Enterprise value is taken from Dealogic; RAB is from the annual report of financial year 2016/17.
Thames Water (Kemble)	Water	02/06/2017	26%	16,715	12,944	1.29	Equity value is taken from Dealogic; RAB and financial data are from the annual report of financial year 2016/17. We adjust for £38m of pension liabilities.
Cadent Gas	Energy	28/06/2019	39%	10,874	9,700	1.12	Equity value is taken from Dealogic; RAB and financial data are from the annual report of financial year 2018/19. We adjust for £690m of pension assets.
Electricity North West Limited	Energy	20/08/2019	100%	1,967	1,820	1.08	Enterprise value is taken from news articles including from Skynews and Expansión, RAB and financial data are from the annual report of financial year 2018/19. We adjust the enterprise value by £33m of pension liabilities.
Western Power Distribution	Energy	14/06/2021	100%	14,400	9,695	1.49	Enterprise value is taken from Dealogic; RAB is from the annual report of financial year 2020/21.
Scotia Gas Networks ¹	Energy	22/03/2022 / 23/03/2022	58%	8,117	6,003	1.35	Equity value is taken from Dealogic; RAB and financial data are from the annual report of financial year 2020/21. We adjust for £299m of pension assets.

Note: ¹ According to the Dealogic database, there were two transactions related to Scotia Gas Networks with a sale of 33% and 25% stakes on 22/03/2022 and 23/03/2022. We combine them into a single transaction MAR, given their completion in two consecutive days.



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