

**Ofwat Price Determinations:
Submission by Energy Networks Association**

1 Overview

- 1.1 Energy Networks Association (**ENA**) is the voice of the networks, representing the ‘wires and pipes’ transmission and distribution network operators for gas and electricity in the UK and Ireland. Our members control and maintain the critical national infrastructure that delivers these vital services into homes and businesses.¹ ENA’s overriding goals are to promote the UK and Ireland energy networks, ensuring our networks are the safest, most reliable, most efficient and sustainable in the world. The combined regulated asset value of our members totals £66 billion.
- 1.2 ENA considers it can assist the Competition and Markets Authority (**CMA**) in the present redeterminations by efficiently and effectively providing submissions in a number of targeted areas from the perspective of its electricity and gas transmission and distribution network operator members.
- 1.3 ENA committed, in its letter to CMA dated 11 May, to provide certain evidence to CMA in advance of CMA’s early June deadline.
- 1.4 ENA submits that Ofwat has made a number of material errors in the determination of price controls for the period 2020 to 2025 (**AMP7**) that should be corrected by the CMA.
- 1.5 This submission focusses on the following important matters with respect to which ENA has evidence that it asks the CMA to consider carefully and take into account prior to making its redetermination:
- (i) The CMA’s exploration of the relationship between gearing and Weighted Average Cost of Capital (**WACC**) in its Provisional Findings in respect of the NATS (En Route) plc (**NERL**) redetermination:
 - has revealed that Ofwat has set an erroneously low Risk-Free Rate (**RFR**) by failing to uplift the spot rate for index-linked gilts (**ILGs**) to account for the unique characteristics of sovereign bonds and the gap between corporate and sovereign risk free borrowing rates – correcting for which (in the context of pure CAPM using cost of new debt) should resolve the CMA’s concerns regarding the relationship between WACC and gearing; and
 - in any event, leads the CMA to suggest an alternative approach to determining the WACC, involving varying the asset beta with gearing, which runs counter to finance theory;
 - (ii) Ofwat is wrong to argue that its analysis of market-to-asset ratios (**MARs**) supports its case that the cost of equity it set for AMP7 is not too low; and
 - (iii) Ofwat has made a number of errors in determining values for betas, resulting in the allowed cost of equity being set too low.

¹ This submission is on behalf of the following ENA members: Cadent, Electricity North West, National Grid, Northern Gas Networks, Northern Powergrid, Scottish & Southern Electricity Networks, SGN, SP Energy Networks, Wales & West Utilities, Western Power Distribution and UK Power Networks. More information on the ENA is available here: <http://www.energynetworks.org/>.

- 1.6 ENA and its consultants would be happy to participate in a hearing to discuss the evidence set out in this submission.
- 1.7 ENA will make an additional submission to the CMA prior to its early June deadline, covering further material issues with Ofwat's approach.
- 2 Ofwat has set an erroneously low RFR by failing to uplift the spot rate for ILGs to account for the unique characteristics of sovereign bonds and the gap between corporate and sovereign risk-free financing rates**
- 2.1 In its Provisional Findings for the NERL redetermination, the CMA states that it has '*some concerns with the consequences of the standard regulatory approach to 're-gearing'*'.² In particular, the CMA is concerned that: '*[...] the cost of capital increases by around 0.5% as a result of the assumed higher gearing of NERL (60%) relative to gearing assumption based on the gearing of comparators (30%), which is not consistent with either finance theory or with our [CMA's] understanding of how actual financing models work*'.³
- 2.2 One of the causes of the CMA's finding that the WACC increases with gearing is the incorrect application of the Modigliani and Miller (**MM**) framework⁴. While the CMA's estimate of cost of debt includes embedded debt, the MM test should be performed based on the cost of new debt alone. This is explained further in Appendix 1 to this submission. **However, even with the correct cost of debt estimate, the issue of the positive relationship between the WACC and gearing persists on the basis of the CMA's analysis in the NERL Provisional Findings.**⁵
- 2.3 ENA appreciates that the CMA's exploration of the causes of this relationship was to some extent preliminary in the NERL Provisional Findings. ENA submits that the CMA should consider that, once the correct cost of debt estimate is adopted as set out in the paragraph above, the cause is the RFR in the capital asset pricing model (CAPM) being too low, leading to an underestimate of the cost of equity at all levels of gearing.
- 2.4 To ENA's knowledge, the need for a detailed examination of whether the RFR has been underestimated has not arisen in any previous price controls. This is because the regulatory allowance for the RFR was set historically at a level above the spot yields on ILGs. However, by virtue of Ofwat (and the CMA in the NERL Provisional Findings) following the UKRN recommendation⁶ and setting risk-free rates based solely on spot yields of ILGs,⁷ an under-estimate of the actual risk-free rate that should be used in the CAPM framework has been revealed. This issue has been brought to ENA's attention by the CMA's concerns regarding the relationship between WACC and gearing expressed in the context of the NERL redetermination.
- 2.5 Oxera's report on this subject is annexed to this submission.⁸ The report demonstrates that:

² Competition and Markets Authority (2020), '*NATS (En Route) Plc /CAA Regulatory Appeal: Provisional findings report*', 24 March (**CMA NERL Provisional Findings**), Appendix D para 4.

³ CMA NERL Provisional Findings Appendix D para 4.

⁴ Modigliani, F., and M. Miller, (1958), "*The Cost of Capital, Corporation Finance and the Theory of Investment*", American Economic Review 48, p261–297 (**Modigliani and Miller 1958**).

⁵ Oxera, '*Are sovereign yields the risk-free rate for the CAPM?*' 20 May 2020. Enclosed at **Annex 1 (Oxera RFR and Gearing report)**, figure 2.1.

⁶ Professor Stephen Wright, Phil Burns, Professor Robin Mason and Derry Pickford (2018), '*Estimating the cost of capital for implementation of price controls by UK regulators*', p31–32.

⁷ Ofwat adds a premium based on the forward curve, but for brevity we refer to the approach as being based on spot yields.

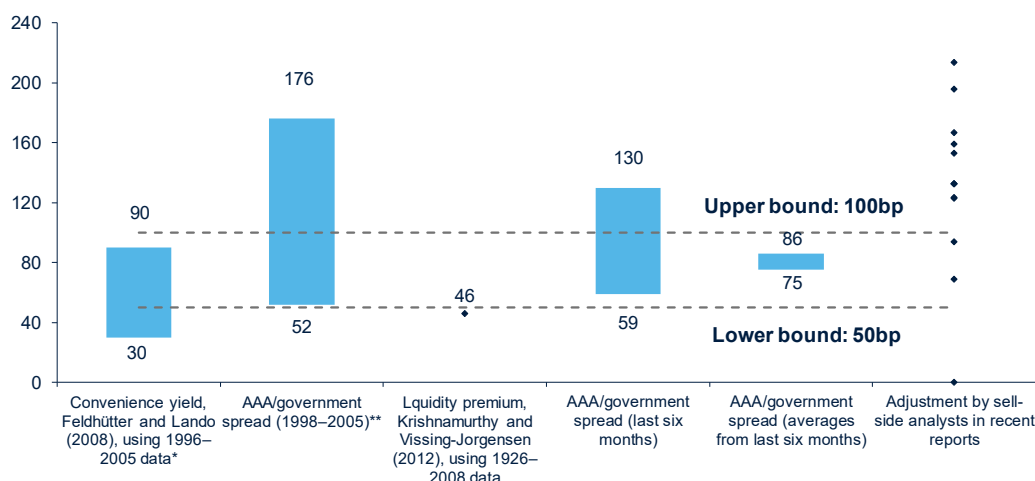
⁸ Annex 1 (Oxera RFR and Gearing report).

- (i) Once the correct cost of debt estimate is used, the relationship of WACC increasing with gearing can be explained by an under-estimate of the risk-free rate; and
- (ii) Equity analysts and academic theory support the use of a risk-free rate that is higher than the spot yields on ILGs.

2.6 ENA submits that, for the reasons set out below, applying an upward adjustment to the RFR in line with Oxera’s recommendations is justified by the unique features of sovereign bonds which influence their low yields and by the available empirical evidence. Further, this resolves the concerns identified by the CMA regarding the relationship between WACC and gearing without the need for a change to the standard approach to ‘re-gearing’ in finance theory and regulatory practice. ENA explains further in Section 3 below and in Appendix 1 why the methodological changes set out by the CMA in Appendix D to the NERL Provisional Findings are in any event inconsistent with finance theory.

2.7 The Oxera RFR and Gearing Report uses evidence from equity analysts, academic literature and yields on AAA corporate bonds to determine that a margin above ILG spot yields is required to estimate the RFR in the CAPM. This rate would then reflect the RFR relevant to an equity investor (i.e. a rate for an asset with a beta of 0). The evidence is summarised in Figure 1 below and points to an upward adjustment to the spot yield for ILGs of 50 to 100bps to determine the RFR for use in the CAPM. This adjustment should resolve the issue observed by the CMA that WACC apparently increases with gearing.⁹ The key elements of the Oxera RFR and Gearing Report are summarised below.

Figure 1: Adjustment to ILG yields based on various sources (bp)



Source: Oxera RFR and Gearing Report, figure 7.1.

2.8 First, the CAPM assumes that investors can borrow at the RFR. However, even with the best credit ratings, non-government investors cannot access debt at the spot rate of ILGs. In that respect, evidence from academic research shows that to be used as a

⁹ Oxera RFR and Gearing Report, Figure 2.2.

proxy for the RFR, the spot yields on ILGs need to be adjusted for the following unique features of ILGs: ¹⁰

- (i) **A convenience ('money-like') premium attached to ILGs that pushes down government yields relative to the risk-free rate:** Feldhütter and Lando (2008)¹¹ find evidence of a sizeable convenience premium embedded in the price of US treasuries. The premium reflects the money-like convenience services offered by ILGs, which have special safety and liquidity characteristics. For example, ILGs can be used as collateral to raise finance, can be readily exchanged for other assets and securities, and are widely recognised as a store of value among all investors. Investors value these attributes of ILGs and are thus willing to forgo some financial returns in exchange for them. The paper finds yields on ILGs embed a material convenience yield, ranging from approximately 30–90bp for US Treasuries between 1996 and 2005;¹²
- (ii) **The gap between the corporate and sovereign risk-free financing rates:** The CAPM assumes that all investors can borrow at the same RFR. However, in reality even the non-sovereign investors with the highest credit-worthiness face higher borrowing costs than those faced by sovereigns with high credit ratings. For instance, Berk and DeMarzo (2013)¹³ comment on the margin between risk-free financing rates for corporate and sovereign investors, concluding that '*practitioners sometimes use rates from the highest quality corporate bonds in place of Treasury rates*'.¹⁴ Paragraph 2.10 below summarises the available evidence on the premium to ILG spot yields necessitated by this feature.

- 2.9 Second, the RFRs assumed by sell-side analysts covering utilities in the UK are consistently higher than the spot yields on ILGs. Oxera reviewed analyst reports on regulated utilities over the last 6 months, extracting their estimates of the RFR. ¹⁵ With one exception the RPI-deflated RFRs adopted by the analysts are consistently and significantly higher than the spot yields on 10-year ILGs. Excluding the one outlier,¹⁶ the risk-free rates adopted by the analysts range between 69bp and 214bp and average at 136bp above ILG spot yields.¹⁷
- 2.10 Third, in line with the recommendation of Berk and De Marzo cited above, Oxera has assessed empirical evidence on the spread between the spot yields on ILGs and those on bonds with low default risk, namely AAA- and AA-rated corporate bonds.¹⁸ Oxera finds that the spreads of iBoxx AAA over government bonds suggest that an appropriate adjustment to the risk-free rate amounts to 75–86bps.¹⁹
- 2.11 Based on this evidence, Oxera recommends using a margin of 50 to 100bps above the spot rate for ILGs to determine the RFR for use in the CAPM.²⁰
- 2.12 As Ofwat has relied on the spot rate for ILGs to determine its proposed RFR for the AMP7 period, its RFR is therefore under-estimated by 50 to 100bps. As Ofwat's

¹⁰ Oxera RFR and Gearing Report, section 3.

¹¹ Feldhütter, P. and Lando, D. (2008), '*Decomposing swap spreads*', Journal of Financial Economics, 88:2,.

¹² Feldhütter, P. and Lando, D. (2008), '*Decomposing swap spreads*', Journal of Financial Economics, 88:2, p375–405.

¹³ Berk and DeMarzo (2014), '*Corporate Finance. Third Edition*';

¹⁴ Berk and DeMarzo (2014), '*Corporate Finance. Third Edition*', p404.

¹⁵ Oxera RFR and Gearing Report, Section 4.

¹⁶ A report by Jefferies which added no premium to the ILG spot yield. See Oxera RFR and Gearing Report, figure 4.1.

¹⁷ Oxera RFR and Gearing Report p15.

¹⁸ Oxera RFR and Gearing Report, Section 6.

¹⁹ Oxera RFR and Gearing Report p18.

²⁰ Oxera RFR and Gearing Report p2.

proposed equity beta is below 1, this error also results in Ofwat’s proposed cost of equity, and ultimately the WACC, being materially too low.

3 The CMA’s exploration of the relationship between gearing and WACC in the NATS Provisional Findings results in the adoption of an alternative model for determining WACC which is inconsistent with finance theory

3.1 For the reasons set out in Section 2, ENA submits that the appropriate solution to the concerns the CMA has identified regarding the relationship between WACC and gearing is to correct the error in setting the RFR without any change to the methodology for calculating the WACC.

3.2 In any event, ENA submits that the novel ‘alternative model’ proposed by the CMA²¹ is problematic, as it is contrary to finance theory. In Appendix 1 to this submission, ENA sets out its concerns in detail. These concerns may be summarised as follows:

- (i) In the CMA’s alternative model (inspired by the MM framework), setting the cost of capital to be independent of gearing requires the asset beta to be flexible to adjust with gearing. This runs counter to established financial theory and practice. The asset beta, by definition, is a measure of the systematic risk of the assets themselves and not any additional equity risk introduced through leverage in the capital structure. It should therefore be constant irrespective of actual or notional capital structure. While the asset beta cannot be estimated directly (unless firms have no debt financing), once the asset beta has been estimated, it should not vary with financial gearing. I.e. the equity beta is determined by the asset beta and gearing and not the reverse.
- (ii) Given the complexities considered by regulators, it would be surprising for regulatory cost of capital relationships to conform perfectly to the relationships set out in the MM paper.²² This was pointed out by Ofwat when it observed ‘while noting the CMA’s finding that an asset beta which varies with gearing may achieve a WACC which is constant we have concerns that a gearing-invariant WACC may not be a good approximation for circumstances in of the water sector, due to the presence of important features of the regulatory framework which are not captured in the Modigliani-Miller theorem.’²³

3.3 Should the CMA seek to further investigate the relationship between WACC and gearing, ENA sets out in paragraph 16 of Appendix 1 the basic principles that should guide its approach to doing so.

4 Ofwat is wrong to argue that its analysis of MARs supports its case that the cost of equity it set for AMP7 is not too low

4.1 The MAR for a particular company compares its market value (sum of shareholders’ equity and net debt – the numerator) to its regulatory asset value (in the water sector, the company’s Regulatory Capital Value (**RCV**) – the denominator).

4.2 For the purpose of its reference of the PR19 price control determination to the CMA, Ofwat commissioned an analysis from Europe Economics which considers the MARs for

²¹ In Appendix D to the NERL Provisional Findings.

²² Modigliani and Miller 1958.

²³ Ofwat, ‘Reference of the PR19 final determinations: Risk and return – response to common issues in companies’ statements of case.’, May 2020, p72-73.

two listed water companies, namely United Utilities (**UU**) and Severn Trent (**ST**). This analysis sought to derive an implied market cost of equity for those companies based on February 2020 market equity valuations, which Ofwat then observed were less than its allowed equity return for PR19. Ofwat contends that these traded equity market premia are too high to be explained by expected out-performance, and argues that this provides evidence that the cost of equity set by Ofwat is not too low.²⁴

4.3 ENA disagrees with Ofwat's reliance on its MAR analysis for UU and ST to support its allowed cost of equity for the water industry, as this does not constitute reliable evidence. Moreover, even if the inherent uncertainties in undertaking this kind of analysis are ignored, an improved analysis demonstrates that traded equity premia over the notional equity portion of RCVs for UU and ST can be explained without any recourse to an assumption that the actual cost of equity is lower than the regulatory allowed base equity return; and, to the extent that conclusions can be drawn, the analysis is consistent with the conclusion that Ofwat has underestimated the cost of equity. A report by Oxera accompanies this submission,²⁵ and this includes further evidence on a number of the issues summarised below.

(a) **Estimates of the cost of equity based on a MAR are forward looking and necessarily based on assumptions, which the CMA has stated is less reliable than historical data**

4.4 One component of the MAR is the market value of the regulated entity. The MAR is a forward-looking measure insofar as the market value incorporates all contemporaneous information that could affect the expectations of future returns.²⁶

4.5 The CMA stated in its provisional findings report on NERL that with respect to the assessment of forward looking approaches in applying cross checks to TMR that '*we have preferred to focus our assessment on the historic data, which we consider to be more robust*'.²⁷ The CMA should therefore exercise similar caution in using MARs as a cross check to cost of equity given the forward-looking nature of this metric.

(b) **United Utilities and Severn Trent are not representative of the performance of the wider sector**

4.6 Ofwat expects a broadly neutral return on regulated equity (**RORE**) risk range for the average notional water company²⁸, but UU and ST are both widely expected to perform strongly relative to the peer group:

²⁴ Ofwat, 'Reference of the PR19 final determinations: Cross-cutting issues', March 2020 (**Ofwat Referral – Cross-cutting issues**), p 36, para 5.19.

²⁵ Oxera, 'What explains the equity market valuations of listed water companies?' 20 May 2020. Enclosed at **Annex 2 (Oxera Equity Market Valuations Report)**.

²⁶ Oxera Equity Market Valuations Report, Section 1.

²⁷ CMA NERL Provisional Findings, para 12.231.

²⁸ Ofwat Referral – Cross-cutting issues, para 4.14.

- Ofwat has raised the bar for service targets and incentives for AMP7 which makes industry wide outperformance unlikely;²⁹ however, some companies, including ST and UU, are expected to outperform;
- Both companies are better positioned to outperform their totex allowances than the wider industry. Both companies face efficiency challenges on their totex plans which are lower than the industry-level average efficiency of 5% imposed by Ofwat;³⁰
- Both are forecast to have a lower cost of debt than the Ofwat allowance;³¹
- The business plans of both UU and ST were fast tracked, Ofwat stated that '*This status gives them reputational, procedural and financial benefits*'³² and specifically includes an additional 10bps on Ofwat's allowed base return over PR19; and
- Both companies have non-regulated business activities, and the difference between their market capitalisations and RCVs are partially explained by the value of these non-regulated activities. For example, in the case of ST, its non-regulated business is considerable, with a market value of more than £500m.³³

4.7 Indeed, despite the similarities identified above, Oxera's report shows that the market's expectation of sources of outperformance varies considerably between ST and UU.³⁴ For example, the analysis finds that over 60% of UU's outperformance is expected to be derived from outperformance on debt, while the equivalent for ST is only 10%. Similarly, 30% of ST's outperformance is expected to be derived from ODIs, while the equivalent figure for UU is nil.

4.8 It is therefore not justifiable to argue that the components of MAR for two companies within the water industry can be representative of all 17 constituents of the UK regulated water sector.³⁵

(c) **Europe Economics' analysis relies on average share prices over the month of February 2020, which is unlikely to be representative of the average MAR in AMP7**

4.9 A critical assumption is the period over which the share price is analysed. The analysis undertaken on behalf of Ofwat by Europe Economics uses average share prices during February 2020 when share prices for both UU and ST were at all-time highs, but does not (for example) analyse the following month when share prices for both companies reduced by over 30%.

4.10 Whilst this is partly due to the timing of when the Europe Economics report was published, and the changes in share price from February to March 2020 could be attributed to the impact of wider market turbulence due to the COVID-19 pandemic, it illustrates the difficulty in understanding the external market factors that influence the share price at any one point in time.

²⁹ Moody's (2020), '*Regulated Water Utilities – UK: Outlook remains negative as price review leads to unprecedented number of appeals*', 30 April, p 11–12.

³⁰ Ofwat Final Determinations, '*Overall level of stretch across costs, outcomes and allowed return on capital appendix*', December 2019, p15.

³¹ Oxera Equity Market Valuations Report, section 4.1.

³² Ofwat Final Determinations, '*Overview of Companies' Final Determinations*', December 2019, p5.

³³ Oxera Equity Market Valuations Report, table 4.1.

³⁴ Oxera Equity Market Valuations Report, Section 4.3.

³⁵ See also Oxera Equity Market Valuations Report, p 3 and 9.

- 4.11 More generally, MARs vary considerably over time including within a single price control period. This can be seen in Ofwat’s own reference of PR19 to the CMA which sets out the composite MAR for ST and UU between 1993 and 2020.³⁶ Even within each 5-year price control period since 1993 the MAR has fluctuated significantly. For example, within the AMP5 period the MARs appears to have fluctuated from close to 30% at its peak to dip below 5%. This variability within a single price control period implies that there may be drivers of MAR other than investors’ views of the outperformance against the cost of capital allowed by the regulator (and the further analysis set out below shows that this is indeed the case).
- 4.12 Oxera’s improved analysis conducted on behalf of ENA uses the average market capitalisation observed for United Utilities and Severn Trent from 1 January until 30 April 2020. Oxera considers that it is appropriate to *‘reflect a range of different market sentiment by using the average over the full period since the Final Determinations’*.³⁷
- (d) **There are significant uncertainties associated with interpreting MARs, which are recognised by regulatory precedent**
- 4.13 Ofwat’s analysis assumes any MAR premium that cannot be explained by *‘an expectation that the companies will outperform regulatory cost allowances and/or receive outperformance rewards related to service performance’* or *‘a change of ownership driving speculative pressure on share price’* implies that investors assume the *‘regulator has set an allowed return on capital that is above the level required by the market or that the required return by market has changed since the final determination’*.³⁸ This ignores the potential for errors in estimating the MAR or other sources of MAR as an explanation of why the market value may not equal the regulatory asset value.
- 4.14 Oxera’s analysis shows that uncertainties in calculating and disaggregating MAR include the following:
- Estimating the market’s view of future outperformance involves significant uncertainty, and a wide range of views exist in the market.³⁹
 - The assumption that all market participants will make assessments purely on cost of capital is only one of only a number of factors in an investor’s decision. Other factors noted in Oxera’s report must be taken into account.⁴⁰
 - There is an inherent inconsistency between numerator and denominator relating to the time periods over which the different components of the MAR are valued.⁴¹
- 4.15 The CMA and its predecessor, the Competition Commission (**CC**), have considered MARs in the context of previous regulatory appeals. This regulatory precedent (set out and considered in Oxera’s report) recognises the significant uncertainties associated with interpreting MARs.⁴²

³⁶ Ofwat Referral – Cross-cutting issues, figure 5.1.

³⁷ Oxera Equity Market Valuations Report, p14.

³⁸ Ofwat Referral – Cross-cutting issues, para 5.15.

³⁹ Oxera Equity Market Valuations Report, Sections 2 and 4.3.

⁴⁰ Oxera Equity Market Valuations Report, Sections 1 and 4.1.

⁴¹ Oxera Equity Market Valuations Report, Section 1.

⁴² Oxera Equity Market Valuations Report, Section 2.

(e) **Ofwat's analysis of the MAR is incomplete and its conclusions rely on unfounded assumptions**

4.16 Ofwat's characterisation of the relevance of MARs analysis has evolved since its Final Determination. At its Final Determination Ofwat suggested that evidence on MARs could be used to inform its entire package of proposals. This was a bold claim, since it ignored the fact that MARs were for only 2 out of the 17 companies in the sector, which cannot be seen as representative as set out in paras 4.6 to 4.8 above. However, in March 2020 Ofwat made a bolder claim that the observed MARs may be explained by investors requiring a lower return compared to Ofwat's allowance for the cost of equity.⁴³

4.17 Oxera's report demonstrates that a number of fundamental assumptions underpinning Ofwat's and Europe Economics' conclusions are unfounded or incomplete.⁴⁴ Oxera's report also notes that there are further factors that must be taken into account in calculating the contribution from company performance which were not adequately addressed in Ofwat's analysis.⁴⁵

(f) **Oxera has undertaken an improved analysis, and this shows that the market premia to regulated equity can be explained without any recourse to an assumption that actual cost of equity is lower than the allowed base equity return**

4.18 The results of Oxera's improved analysis are summarised below. The analysis shows that the net discount or premium to market capitalisation may relate to a number of plausible scenarios. Oxera concludes based on this evidence that *'under a range of plausible scenarios, the current traded premia can be more than explained without any recourse to an assumption that the actual cost of equity is lower than the regulated allowed base equity return. To the extent that conclusions can be drawn, the analysis is consistent with the conclusion that Ofwat has underestimated the cost of equity'*.⁴⁶

⁴³ See Equity Market Valuations Report, Section 3.

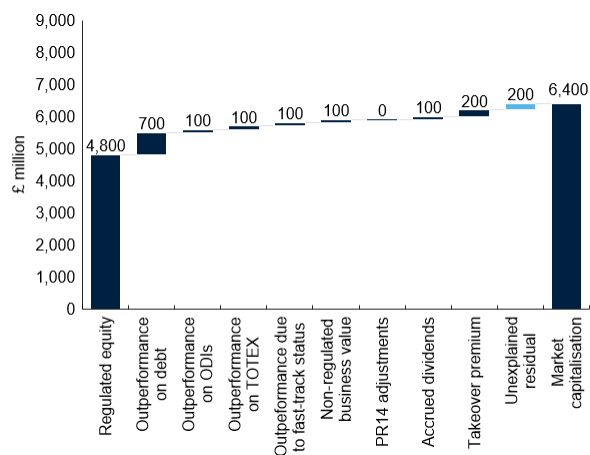
⁴⁴ Oxera Equity Market Valuations Report, Sections 3 and 4.

⁴⁵ Oxera Equity Market Valuations Report, Sections 3 and 4.

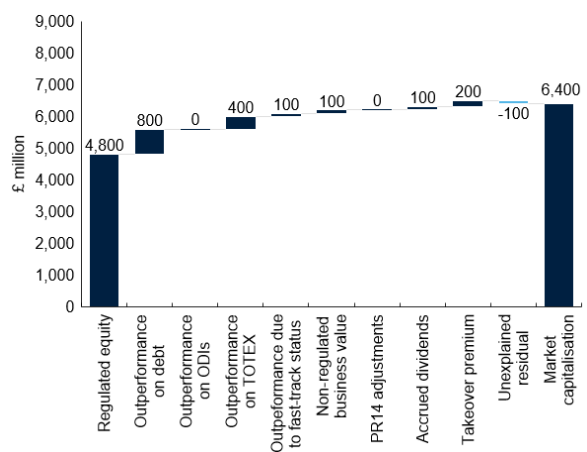
⁴⁶ Oxera Equity Market Valuations Report, Sections 4 and 5. These sections include an explanation of Oxera's approach and methodology, as well as its results and conclusions.

Figure 2: Components of the premium to regulated equity as calculated by Oxera – United Utilities

a) Jefferies case



b) Barclays case



c) Citi Research case

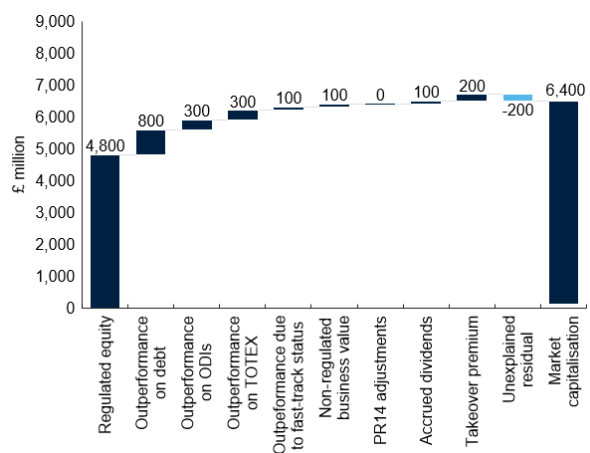
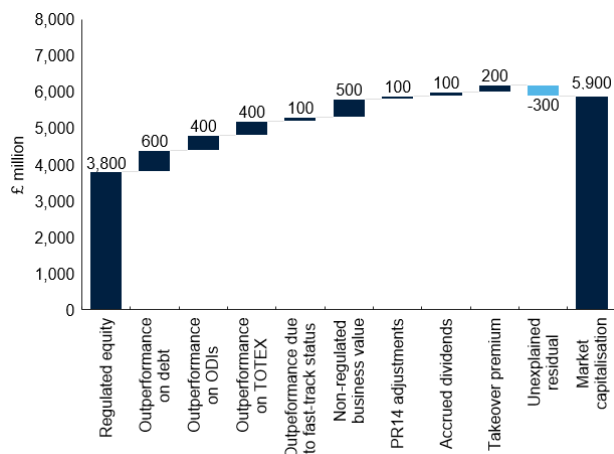
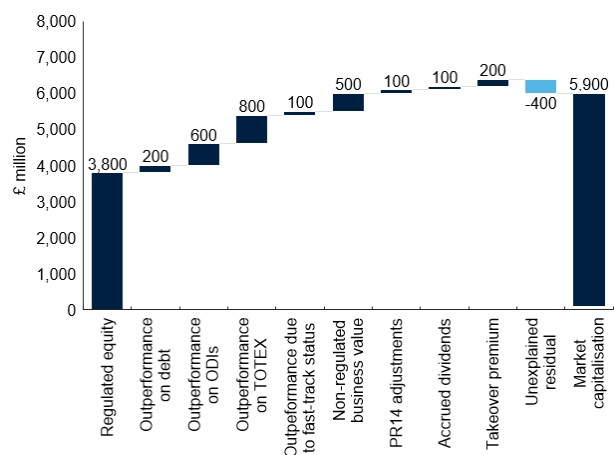


Figure 3: Components of the premium to regulated equity as calculated by Oxera – Severn Trent

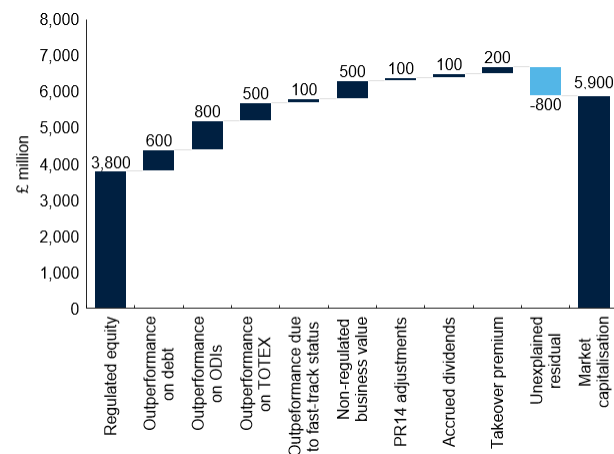
a) Jefferies case



b) Barclays case



c) Citi Research case



5 Ofwat has made a number of errors in determining values for betas, resulting in the cost of equity being set too low

5.1 ENA submits that Ofwat has made a number of errors in determining its proposed asset, equity and debt betas. These errors, individually and in combination, result in the cost of equity being too low.

(a) **Ofwat has failed to take account of uncertainty in ‘raw’ betas**

5.2 ENA submits that Ofwat should have put more weight on the higher end of the range in the selection of a point estimate for beta because (as outlined by Oxera in a recent report for National Grid⁴⁷) the CAPM may not fully reflect the impact of political and regulatory risk and relying solely on CAPM is likely to understate returns required by investors in companies with significant exposure to such risks.

5.3 The Oxera report for National Grid sets out that, in addition to systematic market risk, share price volatility will also be impacted by:

- *‘exposure to other systematic risks—factors that affect multiple companies and where investors cannot eliminate their exposure to these risk factors by investing in a larger, more diversified portfolio of companies;*
- *exposure to idiosyncratic risk i.e. company-specific consequences of political and regulatory actions.’⁴⁸*

5.4 CAPM predicts that investors only require a return for exposure to the systematic market risk, as it assumes that all other risks can be eliminated by investing in a well-diversified portfolio. However, in practice, the literature on arbitrage pricing theory and multi-factor models suggests the existence of systematic risk factors that are not picked up in the CAPM market beta but that are nevertheless priced by investors.⁴⁹

5.5 The Ofwat Final Determination draws on equity return data from a period where regulated utilities have been exposed to an elevated level of political risk. A report on the cost of equity for RIIO-2 prepared by Oxera for ENA in November 2019 shows that the correlation between daily returns on equity of UK networks and the FTSE All-Share reduced because the equity value of these companies declined at the time of a relatively stable wider market, increasing the beta.⁵⁰

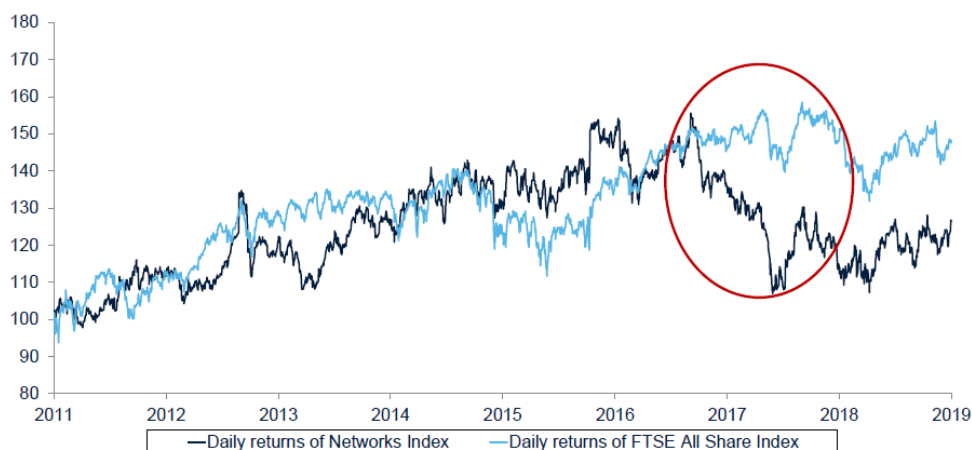
⁴⁷ Oxera report for NG - Assessment of political and regulatory risk, prepared for National Grid Group, 4 March 2019, (**Oxera NG Report**) pages 5 to 7. Enclosed at **Annex 3**.

⁴⁸ Oxera NG Report, p5

⁴⁹ Chen, N., Roll, R. and Ross, S. (1986), ‘Economic Forces and the Stock Market’, *The Journal of Business*, **59**:3, p 383–403; Ross, S. (1976), ‘The Arbitrage Theory of Capital Asset Pricing’, *Journal of Economic Theory*, **13**, p 341–60.

⁵⁰ Oxera, *The cost of equity for RIIO-2: Q4 2019 update*, prepared for ENA, 29 November 2019 (**Oxera 2019 Report**), p46-48. Enclosed at **Annex 4**.

Figure 4: Total Equity Returns of the UK networks and the FTSE All Share indices (2011=100)



Source: Oxera Analysis based on Datastream data

5.6 Oxera concludes that:

the fall in the networks' value versus the FTSE All Share Index over the same period is a further demonstration that, in recent times, UK network companies have been exposed to heightened regulatory and political uncertainty.⁵¹

5.7 Oxera found that in the absence of appropriately calibrated multi-factorial models which would capture this heightened regulatory and political uncertainty and in light of the preference of UK regulators to use the CAPM, it is important that due consideration is given to other systematic and priced idiosyncratic risk factors when interpreting the outputs from the CAPM for determining the cost of equity allowance. Oxera's solution is to select a beta point estimate towards the top of the plausible equity range derived from the CAPM.⁵² ENA submits that Ofwat (and the CMA) should take a similar approach in this instance.

(b) **ENA supports Ofwat's approach to de-gearing and re-gearing in its Final Determination**

5.8 ENA notes the CMA's concerns on gearing adjustments raised as part of the NERL redetermination which have subsequently been commented on by Ofwat in its response to that process. ENA comments more on the gearing adjustments elsewhere in this response however in relation to beta, we believe the cost of equity impacts for differences in gearing need to be reflected in the final figures. ENA therefore supports the original approach Ofwat has used for de-gearing and re-gearing of the raw equity beta which is in line with finance theory and historical regulatory practice.

5.9 If the CMA ultimately adopts UU/ST's actual gearing, and does not de-gear and re-gear using the standard approach adopted in previous price controls. this will lead to the cost of equity for the relevant water companies being determined by actual company financing decisions on gearing taken by the Boards of Directors of UU/ST. If regulators believe that the risks (and possibly rewards) of decisions taken by UU/ST on gearing (reflective

⁵¹ Oxera 2019 Report, p47
⁵² Oxera NG Report, p48-49.

of their particular financial position) are for companies (rather than consumers) to bear, it does not make sense that other companies with potentially different financial positions (and their consumers) should be exposed to those decisions for setting cost of equity. This is one material consequence of using actual gearing for cost of equity which, in ENA's submission, argues strongly in favour of using the standard approach, as adopted by Ofwat in its Final Determination.

(c) Ofwat has used a debt beta that is too high

- 5.10 ENA agrees with the relevant water companies that Ofwat's proposed debt beta of 0.125 is set at a level that is too high.⁵³ This results in the cost of equity being too low.
- 5.11 The Oxera 2019 Report applied the regression approach as applied in Schaefer and Strebulaev (2008) to a large sample of bonds issued by National Grid, Severn Trent, United Utilities, and Pennon Group. The average debt beta for the whole sample remained below 0.05 and for some bonds the estimates were not statistically significantly different from zero.⁵⁴ Oxera concluded by noting that they were '*...of the view that our proposed estimate of 0.05 is a conservative assumption for the debt beta.*'⁵⁵ This provides clear evidence that Ofwat's proposed debt beta is set at a level that is implausibly high.
- 5.12 The CMA's own work as part of the NERL redetermination looked at the appropriate debt beta to apply to the air traffic control sector. The CMA concluded that a debt beta of 0.05 is appropriate for that sector.⁵⁶ Given this aligns closely with the Oxera evidence and findings which are directly relevant to the water sector, ENA sees no reason to assume that higher debt betas should be applied to other regulated sectors such as water or energy.

6 Conclusion

- 6.1 This submission and the evidence to which it refers highlight a number of material errors in Ofwat's determinations of price controls for AMP7, with the result that the determinations are not compatible with Ofwat's general duties under Part I of the Water Industry Act. Accordingly, and noting that the CMA is subject to the same general duties as Ofwat in redetermining the price controls, ENA submits that the CMA must correct these errors, specifically by:
 - (i) increasing the RFR by uplifting the spot rate for ILGs by 50-100bps (thereby also resolving the issue identified by the CMA in the NERL Provisional Findings regarding the relationship between WACC and gearing);
 - (ii) not adopting Ofwat's MARs analysis as a cross-check in setting the cost of equity; and
 - (iii) correcting the identified errors in Ofwat's calculation of asset, equity and debt betas, and increasing the cost of equity accordingly.

⁵³ For example NWL '*Statement of case*', April 2020, paras 861-862, BW, '*Statement of case*', April 2020 paras 308-318.
⁵⁴ Oxera 2019 Report, Table 3.1.
⁵⁵ Oxera 2019 Report, p39.
⁵⁶ CMA NERL Provisional Findings, para 12.115.

- 6.2 ENA intends to provide further submissions and evidence to the CMA on or around 4 June 2020. By providing two tranches of submissions in this way, ENA has sought to assist the CMA by ensuring that robust evidence is prepared and provided to the CMA in as timely a manner as possible.

Appendix 1: Assessment of the CMA's alternative model to the standard approach to re-gearing betas and calculating the cost of capital

1. For the reasons set out in Section 2 of ENA's main submission, ENA submits that Ofwat (and the CMA in the NERL Provisional Findings) has adopted an erroneously low RFR. ENA observes that correcting this error also addresses the issue identified by the CMA in the NERL Provisional Findings (viz. the WACC determined using the conventional regulatory methodology was not invariant with gearing as finance theory suggests it should be) whilst still using the de-gearing and re-gearing approach consistent with established regulatory precedent. Therefore, ENA submits that once the CMA corrects the error in setting the level of the risk free rate, there is no need for it to pursue an alternative model for calculating the WACC.
2. ENA further submits that, in any event, the CMA would err if it preferred the alternative model described in Appendix D of the NERL Provisional Findings over the established de-gearing and re-gearing approach for two reasons:
 - (i) First, it uses an asset beta that varies with gearing, which is inconsistent with the purpose of the asset beta as a measure of the systemic risk in the underlying assets, irrespective of the company's capital structure; and
 - (ii) Second, it does not have regard to the differing approaches to (a) cost of debt and beta leveraging formulae adopted in finance theory on the one hand, and (b) regulatory finance practice on the other, which makes it unsurprising that the cost of capital determined by economic regulators does not have the exact same relationship with leverage as established financial theory would suggest.

Asset beta which varies with gearing

3. In Appendix D of its NERL Provisional Findings, the CMA develops an alternative model to the standard approach to levering betas and calculating the cost of capital. The CMA's alternative model imposes the restriction that the cost of capital must be independent of gearing, taking inspiration from the MM paper. The CMA's position is somewhat different to the 'propositions' presented by MM, who also acknowledged that '*drastic simplifications*' had been made in their analysis and '*much more empirical testing will be required*'. Their propositions were helpful simplifications, but ones on which they and other economists could build real world complexities and market imperfections.
4. In the CMA's analysis, setting the cost of capital to be independent of gearing means that the asset beta has to be flexible to adjust with gearing. Once other parameters are specified, such as the cost of debt and the RFR, the asset beta is the only component which can adjust to provide the cost of equity which the CMA needs to result in a constant cost of capital across different capital structures.
5. This specification of an asset beta which varies with gearing runs counter to established financial theory and practice (excluding extreme or junk levels of gearing which might introduce costs of financial distress). This is because the asset beta, by definition, is a measure of the systematic risk of the assets themselves and not any additional equity

risk introduced through leverage in the capital structure. The asset beta can also be considered the beta for an all-equity financed firm. While the asset beta cannot be estimated directly (unless firms have no debt financing), once the asset beta has been estimated, it should not vary with financial gearing under standard financial theory. The logical causality is that the equity beta is determined by the asset beta and gearing and not the reverse.

6. However, there is a recognised conceptual and empirical challenge in specifying the correct relationship between the equity beta and leverage. The MM paper clearly shows the relationship between equity returns and leverage in its Figures 5 and 6. While MM did not use the now familiar CAPM of Sharpe (1964) and Lintner (1965) to construct the return on equity, observed equity returns clearly rise with leverage.
7. Since both the MM paper and the Shape-Lintner papers, there have been a number of different specifications for the relationship between asset, or unlevered beta, gearing and the levered or equity beta. Myers (1974)⁵⁷, Harris and Pringle (1985)⁵⁸, Hamada (1985)⁵⁹, and Miles and Ezzell (1980)⁶⁰ all developed different beta relationships. Taggart (1991)⁶¹ helpfully compared and contrasted each of these formulae and concluded that they were each applicable but relied on different underlying assumptions. In particular, the assumption around the riskiness of interest tax shields, whether debt is fixed, or whether gearing is kept at a fixed target ratio all drive use of different cost of capital expressions. Furthermore, some expressions are restricted to perpetuity cashflows rather than finite cashflows and some incorporate personal taxation.
8. This means regulators need to apply judgement as to which cost of capital expressions best match their regulatory purposes. ENA submits that the cost of capital for a regulated firm is best calculated by assuming that the gearing ratio (once determined) is fixed (as regulators typically use a stable notional gearing ratio). This means that the amount of debt will vary with the value of the company, and company growth is financed with both equity and debt. This also means that interest tax shields have the same risk as the unlevered firm. This suggests using the Harris-Pringle formula for de-gearing and re-gearing beta, as typically used by UK regulators. This is presented below.

$$\beta_e = [\beta_a - (g * \beta_d)] / (1 - g) \tag{1}$$

where:

β_e is the company's equity beta;

β_d is the company's debt beta;

β_a is the company's asset beta; and

⁵⁷ Myers, S.C. (1974), "Interactions of Corporate Financing and Investment Decisions – Implications for Capital Budgeting", *Journal of Finance* (March), pp. 1–25

⁵⁸ Harris, R.S. and J.J. Pringle (1985), "Risk-Adjusted Discount Rates Extensions from the Average-Risk Case", *Journal of Financial Research* (Fall), pp. 237–244.

⁵⁹ Robert S. Hamada and Myron S. Scholes, (1985), "Taxes and Corporate Financial Management". In Edward I. Altman and Marti G. Subrahmanyam, eds. *Recent Advances in Corporate Finance* (Homewood IL: Richard D. Irwin).

⁶⁰ Miles, J.A. and J.R. Ezzell, (1980) "The Weighted Average Cost of Capital", *Perfect Capital Markets and Project Life: A Clarification*, *Journal of Financial and Quantitative Analysis* (September), pp. 719–730

⁶¹ Taggart, R.A. Jr (1991), "Consistent Valuation and Cost of Capital. Expressions With Corporate and Personal Taxes", *Financial Management* (Autumn), pg. 8–20.

g is the gearing ratio.

9. In contrast, the CMA's alternative model uses an asset beta that varies with gearing. It suggests that the rationale for an asset beta which varies with gearing can be explained by use of multifactor models – those which include more than beta as drivers of equity returns. This possibility is considered in the MM paper: '*because not all the factors which might have a systematic effect on stock yields have been considered*'. However, all other factors considered in these models, including the most well-known Fama-French 3 factor model⁶² (and later expanded 5 factor model⁶³), consider non-leverage factors such as size, book-to-market ratio, dividend yields, profitability and investment. So while these other factors may impact asset beta, leverage is not one of them. This means a multifactor model may produce a better estimate of the asset beta, but it cannot be used to justify the asset beta varying with gearing.

Cost of debt and beta leverage formulae

10. Cost of capital expressions and beta leverage formulae have historically made simplifying assumptions when it comes to incorporating the cost of debt. MM, in their paper, based their propositions on risk-less debt being available for all borrowers (although they also considered their propositions were still valid with risky debt as the increased interest cost would be offset by lower required equity returns). Practitioners have often used beta leverage formulae with simplifying assumptions that debt is riskless, or that the debt beta is zero.
11. In contrast, economic regulators are required to set allowed returns which enable companies to finance their activities and therefore need to include the cost of efficiently raised embedded debt and also the full cost of raising new debt on capital markets.
12. MM did not consider the possibility of embedded debt costs being included in its cost of capital expressions, as they simply considered a prevailing borrowing rate (or '*capitalisation rate for sure streams*') and then relaxed their assumption to allow a rising interest cost with increasing gearing. Similarly, the Sharpe-Lintner CAPM is a one period model, assuming myopic investors, so doesn't accommodate regulatory complexities such as the use of embedded debt.
13. Given the complexities considered by regulators, it would be surprising for regulatory cost of capital relationships to conform perfectly to the relationships set out in Modigliani and Miller's paper and other academic papers. This was pointed out by Ofwat when it observed '*while noting the CMA's finding that an asset beta which varies with gearing may achieve a WACC which is constant we have concerns that a gearing-invariant WACC may not be a good approximation for circumstances in of the water sector, due*

⁶² Fama EF, French KR. (1992), "*The cross-section of expected stock returns*". The Journal of Finance. 1992;47(2):427-465

⁶³ Fama EF, French KR. (2015) "*A 5F-FF asset pricing model*". Journal of Financial Economics. 2015;116(1):1-22.

to the presence of important features of the regulatory framework which are not captured in the Modigliani-Miller theorem'.⁶⁴

14. Instead, there is a need to distinguish between the cost of capital expressions used to set allowed returns and the cost of capital expressions used to identify an optimal level of gearing. The former is about setting a fair return which allows regulated firms to recover efficiently incurred finance costs; the latter helps to set an appropriate capital structure, for the purpose of setting the overall cost of capital.
15. By way of example, it is appropriate to allow a regulated firm to recover efficiently incurred high (in a declining interest rate environment) historic embedded debt finance costs. But this increases the apparent debt premium in the WACC and results in an inconsistency between debt costs measured historically and other financial parameters estimated using more current data. It is therefore unsurprising that moving to a higher gearing will result in a higher WACC. The converse is true when efficiently incurred embedded debt costs are low (in a rising interest rate environment), which would suggest a lower WACC with higher gearing. This means regulators need to be careful about drawing practical conclusions on how gearing impacts WACC using regulatory cost of capital inputs and relationships.
16. ENA submits that, if regulators do choose to investigate the relationship between cost of capital and gearing then the following principles should guide their approach:
 - (i) only the new cost of debt should be used in investigating the relationship as the embedded cost of debt results in an additional allowance or deduction for historically incurred debt. This aligns the timeframe of the cost of capital parameters;
 - (ii) a reasonable debt beta assumption, consistent with a strong investment grade credit rating, should be used (with the traditional Harris-Pringle beta leveraging formula); and
 - (iii) finally, if regulators are to move away from the practice of using long term equilibria rates in the current low rate environment, regulators should set an appropriate RFR that reflects the requirements of an equity investor, which precludes the use of ILG spot rates.
17. If these principles are followed, then the CMA would find that the cost of capital does not rise significantly with gearing.

⁶⁴ Ofwat, 'Reference of the PR19 final determinations: Risk and return – response to common issues in companies' statements of case.', May 2020, p72-73.