NATS En-route plc (NERL) Price Determination: Submission by the 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 In this submission, the ENA sets out:

(a) why the Civil Aviation Authority's (**CAA**) and CMA's approach to setting the cost of equity for NATS (En Route) plc (**NERL**) is likely to have significant impacts on other sectors (**section 2**);

(b) the material methodological errors in the CAA's approach to setting the cost of equity, which operates against the public interest (**section 3**). The ENA has focused its comments on the following issues:

- the total market returns (**TMR**) has been significantly underestimated by the CAA, resulting in the cost of equity being too low;
- the CAA's estimate of the debt beta is too high, resulting in the cost of equity being too low; and
- the CAA was wrong to have selected a value in the lower end of the cost of equity range and ought to have recognised the impact of setting a cost of equity too low and 'aimed-up'; and

(c) why adopting an incorrect approach to cost of equity is not in the public interest and jeopardises the viability and efficiency of regulated industries (**section 4**).

2 The CAA's and CMA's approach to setting the cost of equity is likely to have significant impacts on other sectors

2.1 ENA's members are currently engaged in Ofgem's RIIO-2 price control processes. The price controls for gas and electricity transmission (RIIO-T2) and for gas distribution (RIIO-GD2) are due to commence in April 2021, while that for electricity distribution (RIIO-ED2) is due to commence in April 2023. Ofgem is expected to publish its final view on the price control allowances for RIIO-T2 and RIIO-GD2 by the end of 2020.

[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/.

2.2 ENA is making this submission as an alternative to individual member energy network companies providing individual submissions, to support the efficiency of the CMA determination of the NATS reference.

2.3 ENA's submission is in support of NERL because we consider that the CAA's proposed modifications to NERL's licence relating to the economic regulation of NERL's monopoly air traffic services for the period 2020 to 2024 (known as **RP3**)[2] do not operate in the public interest in so far as they concern the cost of equity. This is a significant issue, with the CAA describing the cost of capital (of which cost of equity is a key component) as a "*key area of difference*" with NERL.[3]

2.4 While there are differences between the various regulated sectors and each regulatory decision must take account of those, regulators have in the past placed weight on the findings of other sectoral regulators and the CMA when considering the cost of equity. It is reasonable to expect that economic regulators may be influenced by the approach taken by the CMA on cost of equity in determining the CAA Reference. The determination will also have an influence on investors' view of the "investability" of the UK regulated infrastructure industries. Indeed, together with the CAA, Ofgem and a number of other regulators (Ofwat, ORR, Ofcom and NIAUR) have signed up to the UK Regulators Network (the **UKRN**) Cost of Capital Principles,[4] which require that the signatory regulators seek to adopt a consistent approach, voluntarily committing to learn from each other's approaches and explaining if they take a different approach to another UKRN member.

2.5 Participating UKRN members have committed to ongoing collaborative working on the cost of capital with, among other things, a Cost of Capital Working Group and support for comparisons of regulatory approaches within decision documents.[5] In the UKRN's Cost of Capital Annual Update Report (September 2019), it stated:[6]

> *The UKRN's cost of capital network will continue to work closely together, bringing together experts from across our member regulators, ensuring that our work in this area is aligned where possible and sharing knowledge and best practice. We shall also be exploring how we can more effectively share resources, including through shared training programmes and exploring the potential for cross-regulator secondments.*

2.6 The impact of such collaborative working can clearly be seen in the CAA Decision, which draws on and makes references to regulatory decisions by other UKRN members (including Ofgem and Ofwat).[7]

2.7 The CAA Decision also makes reference to the UKRN Cost of Equity Report, which was jointly commissioned by the CAA, Ofgem, Ofcom and NIAUR (and representatives from other UKRN members were involved in its governance).[8]

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2 CAA, UK RP3 CAA Decision Document (CAP 1830), 29 August 2019, (the **CAA Decision**). Available here: https://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=detail&id=9206.

3 CAA, Reference to the Competition and Markets Authority of the NERL RP3 price controls, 20 November 2019 (the **CAA Reference**), paragraph 2.11.

4 Available here: https://www.ukrn.org.uk/wp-content/uploads/2018/11/2016MarCoC-Principles.pdf.

5 See summary of the UKRN Cost of Capital Principles. Available here: https://www.ukrn.org.uk/wp-content/uploads/2018/11/2016MarCoC-CollaborativeWorking.pdf.

6 UKRN, Cost of Capital – Annual Update Report, September 2019, paragraph 5.2. Available here: https://www.ukrn.org.uk/wp-content/uploads/2019/09/2019-UKRN-Annual-Cost-of-Capital-Report-Final-1.pdf.

7 See, for example, CAA Decision, paragraphs 7.41 and 7.43.

2.8 Indeed, the CAA describes the fact that its assessment is close to the mid-point in Ofgem's proposed range for the RIIO-2 price controls as one of the "*key factors*" underpinning its assessment.[9] The CAA also emphasises in the CAA Reference the need to take account of other regulators' decisions when setting the cost of capital, and ensuring consistency with those regulators' decisions.[10]

2.9 It is therefore clear that the CMA's determination on the cost of equity for RP3 is likely to have implications beyond NERL and the air traffic services sector. In particular, the energy and water sectors could be impacted in the immediate future as: (a) Ofwat has just published its PR19 determinations[11] and any relevant regulatory references to the CMA would be expected early next year; and (b) Ofgem will be making the first round of RIIO-2 price control decisions in November 2020, with subsequent scope for appeals.

3 The CAA's approach to setting the cost of equity contains material methodological errors and operates against the public interest

3.1 We are mindful that the CMA has a relatively short timeframe within which to make its determination and with that in mind, have sought to make our submission as targeted and focused as possible with a view to presenting the most helpful and relevant evidence to the CMA. We have therefore focused our comments on three particular elements of the cost of equity where we consider there are clear flaws in the CAA's methodology.

3.2 In summary, these are:

(a) the TMR has been significantly underestimated by the CAA, resulting in the cost of equity being too low;

(b) the CAA's estimate of the debt beta is too high, resulting in the cost of equity being too low; and

(c) the CAA was wrong to have selected a value in the lower end of the cost of equity range and ought to have recognised the impact of setting a cost of equity too low and 'aimed-up'.

3.3 Our comments are supported by evidence from our independent expert advisers, Oxera[12] and Frontier Economics, in the form of reports which are annexed to this submission. We have also highlighted other methodological errors in the CAA Decision which we consider the CMA should have regard to in reaching its decision because of the potential implications for read-across into other regulated sectors in sub-section (d).

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8 See Wright, Burns, Mason and Pickford, *Estimating the cost of capital for implementation of price controls by UK Regulators*, 2018 (**UKRN Cost of Capital Paper**). Available at:https://www.ukrn.org.uk/wp-content/uploads/2018/06/2018-CoE-Study.pdf.

9 CAA Reference, paragraph 2.16. See, further, Appendix E of the CAA Decision, paragraph E34, where the CAA considered the TMR ranges used by Ofgem, Ofwat and Ofcom in various market reviews.

10 CAA Reference, paragraph 2.29.

11 See Ofwat's website, available here: https://www.ofwat.gov.uk/regulated-companies/price-review/2019-price-review/final-determinations/.

12 Note that the Oxera reports in the annexes provide CPI-H (Consumer Prices Index including owner occupiers' housing costs) indexed real values, whereas the CAA uses RPI (Retail Price Index) indexed values. Therefore, whilst the methodologies used can be contrasted, the figures in the reports must be re-indexed prior to comparison.

(a) Total market returns have been significantly underestimated by the CAA, resulting in the cost of equity being too low

3.4 We consider that there are four key errors with the CAA's approach to establishing the TMR, as set out below.

(i) The latest asset pricing research refutes the CAA's view that the equity risk premium is a stable parameter

3.5 The CAA Reference summarises three key factors that underpinned its assessment of the TMR parameter of the cost of equity. The second of these factors is stated as:[13]

> *… recent market trends that point to sharp reductions in the risk-free rate and expected returns on equity*.

3.6 This statement suggests that sharp reductions in expected returns on equity necessarily follow from sharp reductions in the expected rate of return from investing in risk-free assets. As the expected rate of return on the equity market cannot be directly observed, it must be inferred from empirical evidence assessed in the context of a realistic framework for how financial assets are priced. The CAA does not, however, set out in the CAA Reference robust empirical, evidential or theoretical bases for why sharp reductions in the expected rate of return on equity would be associated with sharp reductions in the risk-free rate. This is directly contrary to the principle that the TMR is a relatively stable parameter over time. This principle has been recognised by the UKRN, which stated that:[14]

> *… we do not see any obvious evidence in the history of returns themselves to cast doubt on the key evidential basis for the treatment of the EMR: that long-run stock returns are stable in real terms.*

3.7 Oxera provide further evidence demonstrating the relative stability of the TMR over time in the Oxera 2019 Report.[15] However the CAA proposals would represent a reduction of over 15% in the parameter over a five year period since the Competition Commission's determination in *Northern Ireland Electricity* in 2014,[16] which is not a characteristic of a stable parameter.

3.8 As described in the Oxera 2018 Report, finance researchers have developed asset pricing models that are more realistic descriptions of how consumers and investors respond to higher economic uncertainty by simultaneously increasing demand for risk-free assets and reducing demand for risky assets.[17] These models can generate values for the equity risk premium and the risk-free rate that more closely match both the levels and the tendency for negative correlation in the changes of these parameters that have been observed historically. As the risk-free rate decreases, the equity risk premium will increase due to the negative correlation between these parameters.

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13 CAA Reference, paragraph 2.16.

14 UKRN Cost of Capital Paper, page 38. See also page 48. Note that the expected market return (**EMR**) is the same as TMR.

15 Oxera, *The cost of equity for RIIO-2: Q4 2019 update*, prepared for the ENA, 29 November 2019 (**Oxera 2019 Report**), page 19. Enclosed at **Annex 1**.

16 Competition Commission, *Northern Ireland Electricity Limited price determination*, 26 March 2014.

17 Oxera, *The cost of equity for RIIO-2: a review of the evidence*, prepared for the ENA, 28 February 2018 (**Oxera 2018 Report**), pages 14 to 19. Enclosed at **Annex 2**.

3.9 These models support the view that the higher returns earned by investors in the second half of the 20th century compared to the first half were due to an increase in economic uncertainty. This undermines the position adopted by the CAA that the historical TMR is an overestimate of the expected future TMR[18] because past returns were enhanced by good fortune that is unlikely to be repeated. Moreover, the empirical evidence cited in the CAA Decision does not point to a sharp reduction in the expected rate of return on the equity market.

3.10 The CAA Decision refers to analysis by PwC based on a Dividend Discount Model (**DDM**).[19] This analysis indicates that the implied discount rate for equity market cash flows is no lower than it was in 2000 or in 2009–10, and has not exhibited a downward trend. This finding holds whether the trend is assessed over the past ten or twenty years, and regardless of whether today's value is assessed as a spot value or a five-year average.

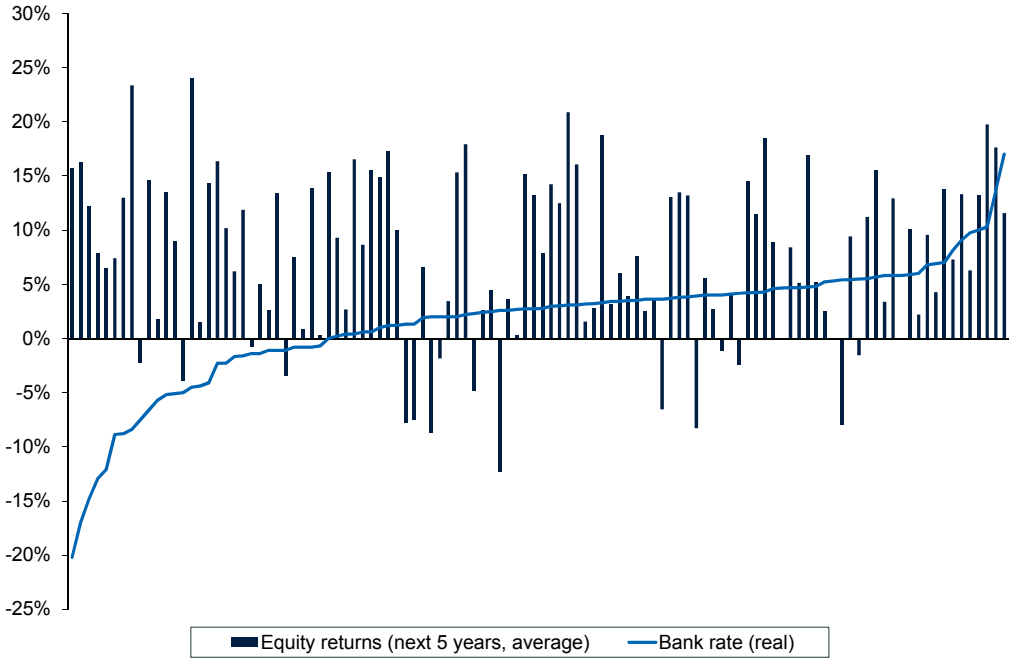
3.11 The CAA Decision also refers to a chart in the Dimson, Marsh, and Staunton Global Investment Returns Yearbook, which suggests that low interest rates have been followed by periods of relatively low equity returns.[20] The Oxera 2018 Report attempted to replicate this finding based solely on UK data from the Global Investment Returns Yearbook.[21] Oxera found that plotting real interest rates derived from the Bank of England base rate and the average UK equity market returns in the subsequent five years does not support the finding that low interest rates have been followed by periods of relatively low equity market returns; this result is robust to sensitivities based on different inflation adjustments and definitions of equity returns. Figure 2.6 from the Oxera 2018 Report is reproduced below to illustrate this point.

18 CAA, *UK RP3 CAA Decision Document: Appendices (CAP 1830a)*, 29 August 2019 (**CAA Decision Appendices**), paragraph E75. Available here: https://publicapps.caa.co.uk/docs/33/CAP%201830a%20appendices.pdf.

19 PwC, *Estimating the cost of capital for H7 and RP3 – Response to stakeholder views on total market return and debt beta*, a report prepared for the CAA, August 2019 (**PwC Report**), Figure 6. Available at: https://www.caa.co.uk/uploadedFiles/CAA/Content/Standard_Content/Commercial_industry/Airports/Economic_regulation/H7/PwC%20-%20WACC.pdf.

20 This chart is reproduced as Figure 5 in the PwC Report.

21 Oxera 2018 Report, pages 21 to 22.



Note: Simple average of equity returns and nominal Bank of England base rate converted to real bank rate using the consumer price inflation growth rate of the same year.

Source: Oxera analysis based on data from Dimson, Marsh and Staunton, Credit Suisse Global Investment Returns Yearbook, Credit Suisse Global Investment Returns Yearbook 2017, and the Bank of England.

(ii) The CAA Decision is based on a calculation of the historical TMR using a CPI series that overstates historical CPI inflation and therefore understates the CPI-deflated equity market return

3.12 The CAA Decision states that:[22]

> *… we continue to consider that the Bank of England CPI series provides a suitable estimate of ex-post real returns as the basis for calibrating forward-looking real returns for use with CPI inflation.*

3.13 The Bank of England provides a disclaimer for the consumer price index (**CPI**) series in the Millennium Databook, which contains the CPI series.[23] The Bank states that the Databook has been constructed on a 'best endeavours' basis, the data contained therein does not constitute official Bank of England data or National Statistics.[24] The disclaimer also states that the spreadsheet should be viewed as 'work in progress' and is intended to be a shared resource that will evolve and expand over time.

3.14 The Oxera 2019 Report investigated the estimates of the CPI prior to 1988 and concluded that these estimates are likely to provide an upwardly biased estimate of the average rate of historical CPI inflation.[25] This conclusion was based on two features of the way the historical CPI series is constructed.

22 CAA Decision Appendices, paragraph E42.
23 Bank of England, *A millennium of macroeconomic data for the UK*, 30 April 2017 (**Bank of England Millennium Databook**), tab 'Front page'.
24 Bank of England Millennium Databook, tab 'Front page'.
25 Oxera 2019 Report, pages 15 to 17.

3.15 First, for the period prior to 1950 the CPI is based on the Consumption Expenditure Deflator series and would therefore include at least some of the upward biases from the RPI formula effect. The Office for National Statistics (**ONS**) agreed with this interpretation.[26]

3.16 Second, for the period from 1950 to 1988, the CPI is based on a 'back-cast' using an ARIMA[27] model of the RPI 'formula effect' to calculate estimates of CPI relative to the RPI series, given that the latter series has been published since 1947. In contrast to the observed average difference of 0.84% between RPI and CPI inflation, since CPI was first published in 1997,[28] the modelled formula effect of 0.29% on average for the 1950–1988 period is surprisingly small, appears to tend towards zero and becomes noticeably less volatile as the back-cast horizon is extended. The figure arrived at is not credible. Furthermore, the CAA has not presented any economic reasoning to justify these features of the back-cast, which suggests that the estimated formula effect may be driven by the ARIMA modelling specification, particularly as the back-cast horizon is extended.

3.17 Oxera estimated that the historical average CPI inflation rate is of the order of 0.45% lower once these features of the data are allowed for, and the arithmetic average CPI-deflated return on UK equities is 7.4% for the period 1899–2018.[29] Expressing this relative to forecast RPI inflation by assuming a 'wedge' of 1% between forecast RPI and CPI inflation, implies an RPI-deflated TMR of 6.4%. This is a full percentage point higher than the point estimate of 5.4% in the CAA Decision.[30]

3.18 An alternative approach is to make use of the longer time series of published data that exists for the RPI, with actual data published since 1947 and estimates for the period 1870–1947 based on the 1947 definition of the RPI.[31] A recent Oxera report for Heathrow Airport identified possible structural breaks in the historical RPI series due to changes in the methodology for calculating RPI.[32] The report investigated the impact on the historical average RPI-deflated equity return of restating the historical RPI to be consistent with how RPI is calculated today. The preliminary analysis indicated that on this basis the arithmetic average of the historical annual real equity market return for the period 1899–2016 would be between 6.4% and 6.8% (RPI-real). This is 100–140bp higher than the point estimate of 5.4% in the CAA Decision.

3.19 A third method would be to deflate historical nominal returns by a forecast of RPI inflation. This method is less conventional than the other two approaches as it combines historical information with forecast data. However, in light of the significant uncertainty over the reliability of the historical inflation data, deflating historical nominal returns by forecast inflation provides an alternative to adjusting historical inflation data for biases. Assuming an RPI inflation forecast of 3% gives an RPI-real arithmetic average return of 7.8% based on a nominal arithmetic average historical return of 11%. This is 240bp higher than the point estimate of 5.4% in the CAA Decision.

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26 Oxera 2019 Report, page 16.
27 Auto-regressive integrated moving average.
28 Calculated for the 1997–2016 period using data from the Millennium Databook.
29 Oxera 2019 Report, page 17.
30 CAA Decision Appendices, paragraph E87.
31 Oxera 2019 Report, page 15.
32 Oxera, *Estimating RPI-adjusted equity market returns*, prepared for Heathrow Airport, 2 August 2019. Enclosed at **Annex 3**.

3.20 The Oxera 2019 Report recommended using the second of these methods – deflating historical nominal returns by a historical RPI series adjusted to be consistent with how RPI is calculated today.[33] This is because the RPI series is more accurate than the CPI series from the Bank of England Millennium Databook as the latter largely relies on back-casted estimates that appear to be subject to upward bias.

(iii) The CAA Decision uses a downward-biased estimate of the TMR due to the weight placed on the geometric average of historical equity market returns

3.21 The CAA Decision adopts the recommendation of the UKRN cost of equity report on how to average the historical equity market returns:[34]

> *…the UKRN cost of equity report suggests that UK regulators estimate TMR starting from the long-run geometric averages, adjusted upwards by 1–2% depending on the extent to which regulators wish to take account of serial correlation of returns, rather than calculating arithmetic averages directly.*

3.22 In 1996, Cooper showed that this approach will lead to a downward-biased estimate of the rate that should be used to discount forecasts of cash flows for the market portfolio (i.e. the TMR as used in the CAPM).[35] The unbiased estimate of the market discount rate will be at least as high as the directly calculated arithmetic average.

3.23 The Oxera 2019 Report explains that the source of the bias is the convexity of the function used to estimate the arithmetic and geometric average discount factors, which results in the estimated expected value of the discount factor being higher than the true expected value.[36] As the discount rate is the inverse of the discount factor, the bias is inverted and the estimated value of the discount rate will be lower than the true expected value.

3.24 As stated previously, the arithmetic average equity return for the period 1899–2018 is 6.4% when expressed relative to forecast RPI, which is a full percentage point higher than the point estimate of 5.4% in the CAA Decision.

(iv) The CAA Decision contradicts evidence from dividend discount models that suggests the expected TMR has not decreased

3.25 The Bank of England has for several years been developing a model for extracting expected equity market risk premiums and returns from market data.[37] The Bank of England uses this model to monitor equity prices and support its monetary and financial stability objectives. The model accounts for share buybacks, the full profile of risk-free rates across different maturities, and detailed modelling of dividend growth

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33 Oxera 2019 Report, page 18.

34 CAA Decision Appendices, paragraph E43.

35 Cooper, I., *Arithmetic versus geometric mean estimators: Setting discount rates for capital budgeting*, European Financial Management, 2:2, 1996, pp. 156–67. Available here: http://faculty.london.edu/icooper/assets/documents/ArithmeticVersusGeometric.pdf.

36 Oxera 2019 Report, page 18.

37 The Bank of England regularly publishes equity risk premium (**ERP**) estimates in its Financial Stability Reports based on the DDM outlined in Inkinen, M., Stringa, M. and Voutsinou, K. (2010), *Interpreting equity price movements since the start of the financial crisis*, Bank of England Quarterly Bulletin, 50:1, pages 24–33. This model has recently been improved in Dison, W. and Rattan, A., *An improved model for understanding equity prices*, Quarterly Bulletin 2017 Q2 (**Dison 2017**).

forecasts for the FTSE All-Share. In relation to the latter point, the Bank of England states:[38]

> *The FTSE All-Share has a high degree of international exposure. Firms in the index generate around 70% of their revenues outside of the United Kingdom… Firms' international exposure means that their profits, and hence dividends, will be influenced by overseas as well as domestic economic developments. That may mean that it is inappropriate to model the long-term expected dividend growth of an equity index as being a function of the outlook for the domestic economy alone.*

3.26 The Oxera 2019 Report presents updated estimates of the equity market discount rate implied by a DDM based on the Bank of England methodology.[39] The current estimate is in line with averages over the past ten and fifteen years, suggesting that there has been no decrease in the expected TMR over this period.

3.27 In contrast to the Bank of England model, the CAA Decision assumes an RPI-deflated TMR of 5.4%, which is 0.85% lower than the 6.25% assumed for the previous price control (**RP2**).[40] The CAA's decision in RP2 was based on a TMR assumption that was already lower than the historical average real equity market return.

(b) The CAA's estimate of the debt beta is too high, resulting in the cost of equity being too low

3.28 The CAA Decision derives an estimate of debt beta that is high relative to estimates based on direct regression analysis of bond returns. The CAA Decision assumes a debt beta of 0.1 based on:[41]

> *…the range of evidence from direct econometric approaches and indirect compositional approaches.*

3.29 The debt beta of 0.1 implicitly places significant weight on estimates based on decomposing corporate bond spreads (the 'indirect method') rather than estimates based on regression analysis (the 'direct method'):[42]

> *… [the CAA is] cautious about placing too much weight on low estimates of debt beta estimated directly from the econometric models [presented by NERL's advisers] …*

3.30 The challenges of the 'indirect method' are described in the Oxera 2019 Report.[43] In summary, the indirect method requires the estimation of four unobservable parameters: the equity risk premium; the default probability; loss given default; and the liquidity premium.

3.31 In contrast, the 'direct method' regresses corporate bond returns against equity market returns in a similar manner to how equity betas are estimated. This also enables the

38 Dison 2017, page 91.
39 Oxera 2019 Report, pages 19 to 21.
40 CAA and Irish Aviation Authority Safety Regulation Division, *UK-Ireland FAB RP2 Performance Plan—Supporting Document*, June 2014, page 259, Figure E2.
41 CAA Decision Appendices, paragraph E138.
42 CAA Decision Appendices, paragraph E137.
43 Oxera 2019 Report, pages 36 to 37.

statistical accuracy of the estimates to be assessed using standard regression diagnostic tests.

3.32 The Oxera 2019 Report applied the 'direct method' consistent with the approach in Schaefer and Strebulaev[44] 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 did not exceed 0.05 and for some bonds the estimates were not statistically significantly different from zero.

3.33 Although Oxera did not estimate the beta for the NERL bond, the evidence from bonds issued by utilities with a strong investment-grade rating does not support debt betas higher than 0.05, and suggests that the weight placed on estimates from the 'indirect method' has upwardly biased the debt beta in the CAA Decision.

(c) The CAA was wrong to have selected a value in the lower end of the cost of equity range and ought to have recognised the impact of setting a cost of equity too low and 'aimed-up'

3.34 In its Statement of Case, NERL describes the importance of ensuring that the allowed rate of return for its regulated activities is set at risk reflective level, in order to ensure that there is an appropriate incentive to invest. NERL also provides a single sentence explanation of the potentially highly damaging consequences of setting the allowed rate of return too low:[45]

> *If the allowed rate of return is set too low, the incentive for investment will be diluted, with potentially significant long-term costs for users and the wider economy.*

3.35 The ENA agrees. While price controls are often multifaceted, the allowed rate of return is the single most important incentive to invest faced by a regulated entity. It follows immediately that setting the headline allowed rate of return too low can be expected to give rise to a material risk of underinvestment leading to both short and long run detriment for users of the infrastructure and the wider economy. In the light of this risk, the ENA submits that regulators and authorities, including the CMA, should rationally choose to aim up when setting point estimates, as this approach will maximise expected social welfare.

3.36 Attached to this response is a recently commissioned independent report on this topic, prepared by Frontier Economics.[46] This report sets out a clear analytical framework to guide regulators when choosing where to locate their point estimates.[47] The key elements of that framework are as follows.

(a) The required rate of return for a future price control period cannot be observed, but only estimated with uncertainty.

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44 Schaefer, S. and Strebulaev, I., *Structural models of credit risk are useful: Evidence from hedge ratios on corporate bonds*, Journal of Financial Economics, 2008, XC:1, pages 1-19.

45 NERL Statement of Case, 28 November 2019 (**NERL Statement of Case**), paragraph 598.

46 Frontier Economics, *Aiming Up and Incentives to Invest: An assessment of Ofgem's proposals*, 17 December 2019 (the **Frontier Report**). Enclosed at **Annex 4**.

47 Frontier Report, section 2.1, pages 8 to 10.

(b) To address this uncertainty, UK regulators typically develop a range of allowed returns by identifying a range of possible values for each component of the allowed return – e.g. the risk-free rate, the beta, the equity risk premium. These ranges for each component are then combined to produce a reasonable range for required returns.

(c) However regulators will ultimately need to select a point estimate from within this range and in the presence of this uncertainty.

(d) Two risks arise as a result – that the chosen point estimate may prove to be too high, or that it may prove to be too low.

(e) If allowed returns are above the required rate, then there will be a transfer from consumers to the regulated company as customers will pay more for regulated infrastructure than is necessary and investors will earn higher returns than are necessary.

(f) If allowed returns are below the true required rate of return, then investors will be unwilling to invest in the asset, and incentives would be undermined and distorted. Underinvestment can lead to a deterioration of operational performance with material detriments to users and the wider economy over time.

(g) Regulatory best practice is to take explicit account of the likelihood of making either of these errors and the consequences of each.

(h) Aiming up is justified. It recognises that setting allowed returns too low results in underinvestment in core infrastructure. This leads to harm to users and the wider economy that is more material than outweighs the modest harm that arises from setting the number too high.

3.37 As the Frontier Report documents, the logic embodied in this theoretical framework has underpinned numerous regulatory decisions in the UK across a range of infrastructure sectors. This includes multiple decisions taken by the CMA where precisely the logic set out above has been used to justify selecting a point estimate for the allowed rate of return at or towards the top of the range identified for the allowed rate of return.[48]

3.38 The ENA therefore considers that the practice of aiming up is strongly supported as regulatory best practice.

3.39 The Frontier Report also provides a review of the academic literature on aiming up. The report finds that this literature follows the theoretical framework set out above, although the small number of contributions to the academic debate apply the framework with varying degrees of rigour and completeness.

3.40 Frontier concludes that Dobbs (2011) provides the most thorough application of the framework.[49] A range of modelled results are presented by Dobbs and these generally support aiming up to at least the 75th percentile. Based on its review of the assumptions that support these calculations, Frontier concludes that Dobbs's findings on the optimal extent of aiming up appear to be conservative.

[48] Frontier Report, section 3.2, pages 12 to 16.
[49] Ian M Dobbs, *Modelling Welfare loss Asymmetries Arising from Uncertainty in the Regulatory Cost of Finance*, 2011; Frontier Report, page 25.

3.41 In summary, the ENA considers that there is a clear theoretical framework to support aiming up when setting allowed returns, as the harm that arises from setting the allowed rate too low is much greater than the harm that arises from setting it too high. This framework has in the past been explicitly recognised by the CMA and embodied in its determinations, as it has by a range of other regulators. This framework (and its implications for regulatory policy) is supported by the academic literature on the topic.

(d) Other comments on the CAA's methodology

3.42 In addition to the points summarised above, we comment briefly on two other issues pertaining to the CAA's analysis.

(i) Risk-free rate

3.43 The CAA Decision uses yields on index-linked government bonds to derive the estimate of the real risk-free rate.[50] In the NERL Statement of Case it is argued that the CAA Decision should also have drawn on evidence from yields on nominal government bonds, deflated by expected inflation.[51] We agree with NERL that evidence from nominal government bonds should be taken into account when determining the real risk-free rate.[52]

(ii) The CAA's estimation of the asset and equity betas contains material errors

3.44 The CAA's estimation of the asset and equity betas has a number of material errors.

3.45 First, the beta estimates for UK utilities understate the risk to which UK utilities are exposed as they omit any non-systematic risk, such as political and regulatory risks to which investors in those companies are exposed, which are largely downside. The CAA Decision draws on equity return data from a period where regulated utilities have been exposed to an elevated level of political risk. The Oxera 2019 Report shows that the correlation between daily returns on equity of UK networks and the FTSE All-Share declined because the equity value of these companies declined at the time of a relatively stable wider market.[53] More generally, in a recent report for National Grid, Oxera outlines how the CAPM may not fully reflect the impact of political and regulatory risk and that relying solely on CAPM is likely to understate returns required by investors in companies with significant exposure to such risks without regard to material differences between the sectors.[54]

3.46 Second, the CAA failed to take sufficient account of a relevant direct sector comparator but instead has placed too much weight on UK comparators in other sectors.[55]

3.47 Third, the CAA Decision is based on betas estimated using daily data only over the last year and last two years,[56] which differs from the approach previously applied by the

50 CAA Decision Appendices, paragraph E99.
51 NERL Statement of Case, paragraph 587.
52 See, for example, the Oxera 2019 Report, page 7.
53 Oxera 2019 Report, pages 46 to 48.
54 Oxera, *Assessment of political and regulatory risk*, prepared for National Grid Group, 4 March 2019, pages 5 to 7. Enclosed at **Annex 5**.
55 Oxera 2019 Report, pages 38 to 39.
56 Europe Economics, *Components of the Cost of Capital for NERL*, December 2018, page 39; and Europe Economics 2019 Report.

CMA.[57] It would be appropriate for the CMA to use data over a longer timeframe when estimating the beta such as its approach in *Bristol Water*.[58]

3.48 The Oxera 2019 Report sets out a best practice approach to estimating asset and equity betas.

4 Adopting an incorrect approach to cost of equity is not in the public interest and jeopardises the viability and efficiency of regulated industries

4.1 The CAA's RP3 price control operates, or may be expected to operate, against the public interest insofar as the cost of equity is concerned. We agree with NERL's submissions that:[59]

> *The public interest is served when NERL's price cap is set in such a way that we are able to recover efficiently incurred expenditure, including a return on the capital investments we make in the business. Setting the allowed rate of return at a level that reflects the riskiness of the business is critical to ensuring that investors have appropriate incentives to invest. If the allowed rate of return is set too low, the incentive for investment will be diluted, with potentially significant long-term costs for users and the wider economy.*

4.2 It is of vital importance that we encourage investment in regulated sectors in order to be able to deliver ambitious plans and the best outcomes for consumers, not only in terms of value for money and reliability of service but also through developing innovative solutions that in turn can drive cost savings and efficiencies. Innovation should be encouraged in all sectors, but is perhaps even more important in sectors that provide essential services. This has recently been recognised by the Government in its consultation on 'Encouraging innovation in regulated utilities' (October 2018). In particular, it stated: [60]

> *Regulators … [must] ensure there is sufficient investment to meet future needs. Independence is a key feature, with companies and investors confident of a stable regime which will allow them to earn fair returns over the long term.*

4.3 The CAA, and other regulators, will not be able to achieve these fundamental aims of preserving independence and investment if the cost of equity proposed does not compensate investors for the risks that they face. As NERL states:[61]

> *Critically, the WACC estimate should reflect the overall balance of risk faced by investors (i.e. it should fully compensate investors for systematic risk). We consider that a WACC estimate that is below the level required to fully compensate investors for systematic risk fails to meet the requirements of the*

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57 CMA, *Bristol Water plc, A reference under section 12(3)(a) of the Water Industry Act 1991*, 6 October 2015, Appendix 10.1, paragraph 98. Available here: https://assets.publishing.service.gov.uk/media/5627997640f0b60368000001/Appendices_5.1_-_11.1_and_glossary.pdf.

58 See further Oxera 2019 Report, pages 31 to 32.

59 NERL Statement of Case, paragraph 598.

60 See https://www.gov.uk/government/consultations/encouraging-innovation-in-regulated-utilities, paragraph 1.4. See also the Government's 'Principles for Economic Regulation' (April 2011) (available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/31623/11-795-principles-for-economic-regulation.pdf), which "reaffirm the importance of, and the Government's commitment to, stable and predictable regulatory frameworks to facilitate efficient investment and sustainable growth" (at paragraph 7).

61 NERL statement of case, paragraph 544.

Financeability Duty, even if there is sufficient cash flow to sustain an investment grade credit rating.

4.4 Bearing this in mind, it seems clear that an approach to economic regulation which focuses excessively on short-term cost minimisation will jeopardise – or indeed stymie – innovation and investment. A successful regulatory regime must allow companies to move forward and progress rather than holding them to a steady state. And any hiatus in progress will introduce new risks which must be weighed against the potential savings. By way of example, the 'net zero' manifesto launched by the ENA on behalf of the energy network companies last month relies on billions of pounds of private investment and explicitly recognises that:[62]

[k]ey to attracting and securing this investment are policy and regulatory frameworks which are stable, long-term and closely aligned to net zero".

4.5 A world-leading innovation of this nature would be placed in jeopardy by a regulatory determination which reduced the allowed rate of return below acceptable levels and left no scope for contingency.

4.6 We therefore encourage the CMA to weigh factors such as the need to enable NERL to respond to challenges when considering whether the CAA has adopted the appropriate methodology, used robust data, and whether on balance its decision operates in the public interest.

[62] See http://www.energynetworks.org/assets/files/Final%20ENA%20general%20election%20manifesto%202019.pdf. The accompanying press release states: "*Our collective efforts must be backed by billions of pounds of private investment. Key to attracting and securing this investment are policy and regulatory frameworks which are stable, long-term and closely aligned to net zero. Energy network companies are investing £45 billion in the decade up to 2023 and delivering world-leading innovation to help solve our toughest problems – from outlining a pathway to net zero heat to laying the foundations for the country's smarter electricity grid.*"