Heathrow Airport Limited: third party submission in the CMA RP3 redetermination

Date: 24 December 2019

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Status: Final

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1. Executive summary

1.1 On 29 August 2019, the Civil Aviation Authority (***CAA***) published its decision on the economic regulation of NATS (En Route) plc (***NERL***) for the period 1 January 2020 until 31 December 2024 in CAP 1830 (***RP3***). NERL rejected the CAA's decision on 10 September 2019, and the CAA referred the disputed licence conditions to the Competition and Markets Authority (***CMA***) on 19 November 2019 (***NERL Reference***).

1.2 Heathrow is submitting this third-party submission to the CMA as the CAA's approach in RP3 materially and directly affects the operations and future success of Heathrow. In particular, Heathrow asks the CMA to carefully re-consider the CAA's decision on weighted average cost of capital (***WACC***) for NERL as the CAA's approach to that issue will have major practical consequences, negatively affecting not only NERL but the UK aviation generally, including customers.

1.3 As explained in this submission, NERL's RP3 decision is important to Heathrow's ongoing operations for the following reasons:

(a) first, investment at NERL is fundamental to Heathrow's existing and future operations and is critical to meet UK Government objectives in relation to Heathrow's expansion plans as well as airspace modernisation more broadly. Heathrow is a direct customer of NATS Services Limited (***NSL***) for air traffic control services at Heathrow Airport,[1] and works closely with NERL in respect of UK air traffic services, aircraft that are on the approach to Heathrow Airport, and the airspace modernisation programme. NERL's services are critically important at Heathrow Airport. Therefore, any lack of investment at NERL, affecting its ability to deliver airspace services fast and efficiently, has a direct impact on Heathrow's current and future performance, and a third runway at Heathrow will not be useable if UK airspace is not fit for purpose;

(b) second, contrary to its statutory duties and regulatory best practice, the CAA has failed to strike the right balance in determining NERL's WACC. Heathrow therefore urges the CMA to consider the issue of cost of capital afresh in the context of this redetermination; and

(c) third, the CMA's decision on WACC will be directly relevant to Heathrow's own upcoming price control as well having potential implications for other UK regulated industries. The CAA itself has drawn specific links between the approach it will take to WACC in RP3 and Heathrow's upcoming price control (***H7***). The CAA's current approach to WACC is at odds with CMA guidance on best practice and recent industry recommendations, and will set a harmful precedent if not corrected by the CMA.

1.4 For the above reasons, Heathrow is concerned about the impact that the CAA's decision in RP3 will have on NERL and Heathrow, in particular in relation to WACC. Specifically, Heathrow considers that the CAA's methodological approach to assessment of total

[1] NSL and NERL are both subsidiaries of NATS Holdings Limited, which is the parent company of the NATS Group.

market return (***TMR***) and asset beta in its calculation of the NERL's WACC was flawed for the following reasons:

(a) the CAA's calculation of a TMR of 5.4% is not supported by the available evidence which in fact suggests a TMR closer to 6.5% or an updated estimate of 6.75%. Despite acknowledging that market expectations have not reduced since previous CMA decisions,[2] the CAA has ignored available evidence and nevertheless adopted a lower TMR and taken an erroneous approach both in its historic and forward-looking estimates:

(i) historical estimates relied on by the CAA are flawed in particular due to:

(A) an inappropriate approach to adjusting for historical inflation and the historic and future wedge between retail price index (***RPI***) and consumer price index (***CPI***); and

(B) an arbitrary adjustment between geometric and arithmetic averages of historical returns.

(ii) the forward looking estimates relied on by the CAA have excluded the most reliable evidence from independent third parties not directly concerned with regulatory debates on WACC (including the Bank of England (***BoE***) and Bloomberg) and instead relied on approaches which fail to consider reasonable market views as they do not take account of analysts' forecasts in the short term, and global (as well as UK) growth in the long term; and

(b) the CAA has also referred to Heathrow as a comparator or cross check for NERL, but in doing so the asset beta range that the CAA uses for Heathrow of 0.42 - 0.52 was too low by comparison with available evidence relating to comparable international airports. Even if the CMA considers Heathrow to be a suitable comparator for NERL in this context, Heathrow submits that a balanced view of the available evidence from Groupe AdP (***ADP***) and Fraport AG (***Fraport***) supports an asset beta range for Heathrow of between 0.54 - 0.62. The CAA's analysis was flawed primarily due to the inappropriate inclusion of Large Cap index estimates.

1.5 Against this background, the CMA's decision on the redetermination of NERL's price control is of significant importance for both Heathrow and the UK aviation sector more broadly. The CAA's decision and approach has given rise to widespread concern in the industry, more broadly than NERL. Therefore, Heathrow urges the CMA to reconsider the price control decision for NERL, and in particular the WACC calculation, with fresh eyes, scrutinising the available evidence to reach a more reliable and robust decision than that reached by the CAA.

2. Air traffic control plays a vital part in supporting Government objectives and Heathrow's existing and future operations

2.1 The maintenance and development of air traffic control is critical to airports, airlines and the safety of users of air transport. A properly funded and flourishing air traffic operation

[2] CAA, *Response to NERL's Statement of Case*, December 2019, Executive Summary, para. 10.

lies at the heart of the UK Government meeting its objectives regarding the much-needed airspace modernisation strategy, and is a central foundation of the day-to-day and long-term success of UK airports such as Heathrow (especially in light of the upcoming proposed expansion). Therefore, it is of high importance to the UK airport and aviation sector as a whole that NERL is able to fund its activities and raise the investment required to ensure it both maintains the current necessary standards and is able to achieve continued development and success. Heathrow therefore sets out below the key background against which the CMA is making its decision at a vital time for the UK aviation sector.

NERL's success is critical in order to meet UK Government objectives

2.2 The UK Government has a clear focus on developing and modernising the aviation sector due to the expected growth in the sector across the UK. The Department for Transport (***DfT***) and the CAA are working together to act as co-sponsors for the modernisation of the UK's airspace.[3] The DfT and CAA state that "[*m*]*odernising airspace means updating its structural design, changing how the systems on which it runs work, and using new technology to improve how air traffic is managed*".[4] The UK Government has been consistent in its position that upgrading airspace forms an integral part of the wider airport modernisation strategy throughout government literature, including the CAA's own Airspace Modernisation Strategy.[5]

2.3 As recognised by the CAA in its reference to the CMA (the ***CAA Submission***),[6] airspace modernisation will be vital to deliver benefits to consumers by enabling more efficient flight paths that can increase capacity, provide better access to airspace for all users, reduce noise for local communities, deliver more carbon efficient routes and reduce delay for passengers.[7] The expansion of Heathrow to include a third runway represents a key component of modernisation, but also the operation of the third runway requires airspace modernisation.

2.4 Therefore, unless NERL is able to fund the necessary upgrades to air traffic control to support the modernisation of airspace alongside maintaining current operations safely, the entire modernisation strategy and associated changes to operations will be jeopardised. Importantly, NERL needs the appropriate resourcing to ensure the retention of staff of the right technical calibre in order to implement the modernisation program and maintain the required levels of service in the face of the growing demands across the UK. Specifically, without the required investment needed in airspace modernisation and specifically air traffic control, the UK aviation sector is likely to see:

[3] DfT and CAA, *Guidance: airspace modernisation*, May 2019.
[4] DfT and CAA, *Guidance: airspace modernisation*, May 2019.
[5] CAA, CAP 1711, *Airspace Modernisation Strategy*, December 2018. The Airport Modernisation Strategy outlines the detailed initiatives that industry must deliver to achieve the objectives envisaged in current government policy to modernise the airspace. It recognises the importance of air traffic control in this regard (see, for example, paras. 1.2, 1.22, 2.17, 2.6, 2.52, 4.17, 4.39 to 4.52 and page 92 to 93).
[6] CAA, CAP 1857, *CAA Reference to the CMA of the price controls*, December 2019, para. B28.
[7] DfT, *Consultation Response on Legislation for Enforcing the Development of Airspace Change Proposals*, October 2019.

(a) **Increased delays:** air traffic control is facing heavier traffic and constrained capacity with over 3 million flights expected in the UK by 2030.[8] Investment and proper resourcing of air traffic control is therefore key to ensure that air traffic control is as efficient as possible to address both the existing delays in the system as well as the considerable challenges posed by the projected growth in traffic. The DfT has stated that without sufficient investment, "*airspace capacity will ultimately become the constraining factor on growth in the aviation sector and the supply of flights to some destinations may be lost*".[9] In the absence of the required investment in air traffic control, delays are likely to increase exponentially – for example:

(i) according to the DfT, without airspace modernisation, delays and cancellations caused by airspace capacity constraints are predicted to increase to a level whereby in 2030: "*one in three flights from the UK are expected to depart over half an hour late and many scheduled shorthaul flights would be forced to cancel*";[10]

(ii) NERL has recognised that delays are increasing: for instance, in 2018 NATS' delays per flight increased from 7.7 seconds to 12.5 seconds, which was above the regulatory target of 10.8 seconds and resulted in a service penalty of £0.3 million.[11] According to Eurocontrol, in the European Union in June 2019 more than 210,000 flights (20% of the total) were delayed. Already, the vast majority of these delays were due to a lack of air traffic control capacity, driven by inadequate staffing, inflexible rostering and an inability to react to disruptive events.[12] A report presented to the European Commission noted that in 2018 European air traffic grew by 14% but delays increased by 273%.[13] The report stated that this was a consequence of air traffic management issues, highlighting technology and a lack of flexibility in Air Traffic Control Officer staffing levels as particular constraints.[14] The challenge for NERL over the RP3 period is therefore to make the investment in staffing and systems needed to maintain and enhance performance in delays and safety while at the same time meeting the considerable challenges that projected growth in traffic will give rise to;

(b) **Higher costs:** the DfT recognised that any increase in flight delays, short notice cancellations or constraints on the number of scheduled flights would have high levels of impact for "*all involved in aviation*"[15] and estimates that *"with no airspace*

[8] NERL, *Air traffic numbers heat up as summer holidays get underway*, https://www.nats.aero/news/air-traffic-numbers-heat-up-as-summer-holidays-get-underway/ (accessed 22 November 2019).
[9] DfT, *Upgrading UK Airspace Strategic Rationale*, February 2017, para. 3.1.
[10] Ibid., para. 3.6.
[11] Note that 4.8 seconds of the increase in delay was attributed to the move to an integrated electronic system to record information about aircraft. See NERL, *NERL Statement of Case*, November 2019, p. 155 and NATS, *Annual Report 2019*, p. 24.
[12] Eurocontrol, *Monthly Network Operations Report*, June 2019.
[13] Wise Persons Group, *Report of the Wise Persons Group on the Future of the Single European Sky*, 15 April 2019.
[14] Ibid., p. 8.
[15] DfT, *Upgrading UK Airspace Strategic Rationale*, February 2017, para. 3.11.

modernisation the additional costs borne by the aviation industry and its customers could be c£260 million a year and rising thereafter".[16] The Airports Commission also estimated that, over a sixty year period, failing to address the need for extra airport capacity in the UK could cost passengers £21-23 billion in the form of fare increases and delays, and potentially £30-45 billion to the wider economy;[17]

(c) **Degradation in quality:** the DfT has stated that the failure to fund the necessary upgrades to air traffic control would have significant impact not just on airports, airlines and their passengers but also on the UK economy as a whole by reducing the quality, value and provision of air transport services;[18]

(d) **Disruption caused by increased strikes:** the DfT has recognised that, without sufficient investment, the UK aviation industry does not have the resilience to deal with disruption, including strike action.[19] In 2017, Airlines for Europe (***A4E***) calculated that air-traffic strikes alone have cost the European Union economy €12 billion since 2010[20] and that there was a 53% rise in delays due to air traffic control staffing issues in 2018, forcing the 15 biggest European airlines to cancel more than 5,000 flights;[21] and

(e) **Environmental harm:** the CAA has recognised itself that many air traffic management practices have not been invested in and are therefore not currently utilising the best modern technologies available, and consequently aircraft to and from the UK continue to use flightpaths that are outdated. This results in constrained *"aircraft climb performance such that more time is taken for them to reach their optimum cruising altitude. This creates inefficiencies and results in greater fuel burn and more emissions"*.[22] The introduction of a significant number of additional plannable entry and exit points (i.e. more direct routes) is designed to address these inefficiencies, but air traffic control systems cannot manage these options without significant modernisation.[23] In addition, delays result in increased emissions as aircraft are required to spend time taxiing or in holding stacks awaiting the opportunity to land.

2.5 Accordingly, the modernisation of UK airspace is inextricably linked to the modernisation of air traffic control and modernisation cannot succeed without significant investment in air traffic control. The CAA itself sets out the need to modernise "*air traffic management systems, tools and procedures used by air traffic controllers, network managers, flight crews and other operational stakeholders*".[24]

2.6 Heathrow is aware that the required investments to modernise NERL's operations are significant and highly complex. NERL is taking the lead on a wide range of necessary

[16] Ibid., para. 3.13.
[17] DfT, *Aviation 2050, The future of UK aviation*, December 2018, para. 1.20.
[18] Ibid., para. 3.15.
[19] DfT, *Upgrading UK Airspace Strategic Rationale*, February 2017, para. 2.18.
[20] PwC, *Economic Impact of Air Traffic Control Strikes in Europe*, September 2016, p. 7.
[21] A4E, *Air Traffic Control (ATC) strikes are destroying air traffic and economies across Europe,* June 2018.
[22] CAA, CAP 1711, *Airspace Modernisation Strategy*, December 2018, para. 1.7.
[23] DfT, *Upgrading UK Airspace Strategic Rationale*, February 2017, para. 7.7.
[24] CAA, CAP 1711, *Airspace Modernisation Strategy*, December 2018, para. 4.39.

airspace modernisation strategy initiatives, including new airspace designs, procedures and technology to increase options for airspace configurations and redesign of new arrival and departure routes using satellite based navigation standards.[25] The developments will require flightpaths to be redrawn in a coordinated way in accordance with established international aviation procedures.[26] NERL will therefore need to work closely with a wide range of stakeholders in the UK and internationally on structural changes to the route network – in particular, with airports in order to ensure that the changes fit together seamlessly and contribute to an effective airspace infrastructure fit for the future.[27] This complex process of modernisation will also need to be undertaken while continuing to ensure sufficient resources are available to fully support NERL's existing operations.

2.7 The CAA set out in RP3 that its modernisation strategy was a "*key strategic driver for NERL in RP3*".[28] Heathrow welcomes the CAA's acknowledgment of this strategy and considers that the CAA plays a central role in promoting and supporting the modernisation of the UK aviation sector. However, Heathrow is concerned that the CAA's decision has not taken proper account of this background or its implications for the required funding of NERL's operations in RP3.

NERL's operations have a particularly significant impact on the current and future performance of Heathrow

2.8 In addition to the above factors, which will impact UK airports across the board, air traffic control, and NERL specifically, is of particular significance for Heathrow.[29] As outlined in paragraph 1.3(a) above, Heathrow relies upon NERL to deliver airspace services efficiently, and will suffer – both currently and especially with future expansion plans for a third runway – if NERL is unable to do so. Heathrow therefore fully endorses NERL's comment in its initial submission that the cost to airports "*of an interruption in our service, or large delays, can be much larger than the marginal cost of keeping the network resilient and fit for purpose*".[30]

2.9 If NERL is unable to effectively service aircraft or flow rates in future due to cost-cutting measures or lack of investment, this will have a significant consequential effect on Heathrow's operations and overall resilience. A NERL system failure in December 2014 resulted in departures from all London airports being stopped, with disruptions affecting airlines, airports and passengers into the next day.[31] The effect of any failures will become particularly acute in the event of disruptions at the airport such as adverse weather. On 26 July 2019, radar issues at NATS Swanwick led to reduced positions

[25] DfT and CAA, *Annex to the Airspace Modernisation Strategy*, December 2018, Table A1.
[26] CAA, CAP1616, *Airspace Design: Guidance on the regulatory process for changing airspace design including community engagement requirements*, November 2018, Appendix F.
[27] DfT and CAA, *Guidance: airspace modernisation*, May 2019.
[28] CAA, CAP 1830, *UK RP3 CAA Decision Document*, August 2019, Executive Summary, para. 5.
[29] For completeness, LHR Airport Limited annual report and financial statements for the year ended 31 December 2018 confirms that LHR Airports Limited owns 4.19% of NATS Holdings Limited (see page 37). LHR Airports Limited is part of the same Heathrow Group as Heathrow Airport Limited, and NATS Holdings Limited is the ultimate parent company of NERL.
[30] NERL, *NERL Statement of Case*, November 2019.
[31] Robert Walmsley, Timothy Anderson, Clay Brendish, John McDermid, Martin Rolfe, Joseph Sultana, Mark Swan, Michael Toms, *NATS System Failure 12 December 2014 – Final Report*, 13 May 2015, page 3.

available for NERL Heathrow operations and in combination with poor weather and other restrictions in airspace for the same reasons, the punctuality for LHR was only 40% by the end of the day with an average delay for flights of 34 minutes (compared to the average daily punctuality for 2019 of currently 78%).[32]

2.10 Conversely, sufficient funding and investment by NERL in resilience and modernisation measures has a positive impact on the quality of Heathrow's services to consumers. In a recent report by ICS Consulting (for the purpose of supporting Heathrow's regulatory investment plan submissions in H7 and ensuring value for consumers), the report shows that expenditure on improving departure and arrivals punctuality at Heathrow has the highest level of benefits over costs as compared to other possible areas of investment by Heathrow. This is inevitably linked to the efficiency of NERL and investment in it.[33] As detailed in Section 3, Heathrow's view is that the CAA's decision in particular in relation to WACC does not properly balance the potentially significant adverse consequences of any cost-cutting or delayed investment by NERL against the significant economic and consumer benefits expected if NERL is able to make the investments envisaged in its business plan.

2.11 The direct impact of investment (or lack thereof) by NERL on Heathrow's service is clear from recent examples. According to an independent enquiry carried out following a NERL systems failure in 2014, capital investment by NERL "*coincided with an impressive improvement in delay performance*".[34] Over RP2, NERL's successful deployment at Heathrow of Time Based Separation, followed by enhanced Time Based Separation and the first phase of extended arrivals manager systems (***AMAN***), are estimated to have reduced delays in strong headwind weather conditions by more than 60%. This is equivalent to extending Heathrow's operating day by 30 minutes[35], supporting Heathrow's objectives for sustainable and resilient operations.

Investment in NERL's operations is particularly important at this time of upcoming expansion for Heathrow

2.12 A central tenet of the UK Government's aviation strategy is its support for the expansion at Heathrow.[36] Frontier Economics estimates that net present value of the benefits of investment in expansion at Heathrow for consumers and the economy is £187bn,[37] including through lower fares and new flights driven by increased competition and choice from airlines operating at Heathrow.[38]

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[32] The Evening Standard, Flight delays after technical problems with UK air traffic control system, *https://www.standard.co.uk/news/transport/flights-delays-after-technical-problem-with-uks-air-traffic-control-system-a4199096.html* (accessed 20 December 2019).
[33] Appendix C: ICS Consulting*, Developing the Cost Benefit Analysis Framework Valuations and Initial CBA Results*, July 2019.
[34] Robert Walmsley, Timothy Anderson, Clay Brendish, John McDermid, Martin Rolfe, Joseph Sultana, Mark Swan, Michael Toms, *NATS System Failure 12 December 2014 – Final Report*, 13 May 2015, para. 5.7.5.
[35] NERL, Enhanced Time Based Separation adds valuable resilience to Heathrow operation, *https://www.nats.aero/news/enhanced-time-based-separation-adds-valuable-resilience-heathrow-operation/* (accessed 20 December 2019).
[36] DfT, *Airports: The Government's View*, October 2016.
[37] Frontier Economics, *Competition and Choice: A report prepared for Heathrow*, December 2017, p. 51.
[38] Appendix F: Heathrow, *Initial Business Plan, WACC Chapter*, p. 2.

2.13 In 2015, the Airports Commission recognised the value in the expansion at Heathrow as a pillar of the Government's aviation strategy but was concerned as to whether airspace structures could support the increased capacity that would be created. With NERL's assistance, it confirmed that, "*while managing the expected increase in traffic that would accompany any of the schemes was likely to be challenging, it should nevertheless be achievable provided airspace structures could be modernised suitably, taking advantage of technological advances*".[39] The Airports National Policy Statement went further and stated that changes to air traffic control "*will be necessary with or without expansion*".[40]

2.14 Without a successful modernisation programme (including in relation to air traffic control), the extensive benefits delivered by capacity expansion at Heathrow will not be realised – in particular, Heathrow will not be able to effectively utilise the third runway if NERL's services are not fit for purpose, and if it has not been able to properly engage in and carry out the airspace modernisation programme. Heathrow is particularly concerned as NERL has stated in its Statement of Case that, in the event it is forced to implement the changes proposed by the CAA, the likely consequences will be adverse to the public interest and could include, among other consequences, an inability to support the additional staffing requirements for the third runway at Heathrow.[41] It is therefore vital for Heathrow that NERL is regulated in such a way to allow it to be a strong and efficient provider in this crucial period.

2.15 However, for the reasons set out below, the CAA's RP3 decision (particularly in relation to the decision for WACC) is likely to place NERL at significant risk of being unable to deliver on maintaining necessary service levels and modernisation objectives. Insufficient funding and investment in NERL and the necessary updates to air traffic control will lead to detrimental outcomes for Heathrow and UK air transportation as a whole.

3. The CAA has breached its statutory duties in setting NERL's cost of capital

3.1 The CMA has a statutory duty to investigate and report on whether matters in the NERL Reference "*operate against the public interest*" (section 12(1)(a) Transport Act 2000 (***TA 2000***)). As the CAA itself highlights, the cost of capital drives the biggest difference (over 90%) in financial value between the CAA and NERL and Heathrow expects this to be a central issue in the CMA's decision-making process.[42] In Heathrow's view, the CAA's RP3 decision on cost of capital is demonstrably not in the public interest and the CAA has not struck the right balance in determining the cost of capital contrary to its statutory duties as well as regulatory best practice. In the CMA's re-determination decision, Heathrow submits that, in having a proper regard to the statutory duties relevant to air traffic control and the issues at stake, the CMA must correct this error.

[39] Airports Commission, *Final Report*, July 2015, para. 12.12.
[40] DfT, *Airports National Policy Statement: new runway capacity and infrastructure at airports in the South East of England*, June 2018, para. 3.47.
[41] NERL, *NERL Statement of Case*, November 2019, para. 306.
[42] CAA, CAP 1857, *CAA Reference to the CMA of the price controls*, November 2019, Executive Summary, para. 15.

The CMA's statutory duties

3.2 Under the TA 2000, in deciding whether a matter operates against the public interest, the CMA has a duty to "*have regard to the matters as respects which duties are imposed on the…CAA*" (section 12(8), TA 2000).

3.3 In relation to air traffic control, the primary duty imposed on the CAA is "*to maintain **a high standard of safety** in the provision of air traffic services*" (section 2(1), TA 2000). This duty contrasts with other regulatory contexts (such as energy) where the principal objective of the regulator has a more direct focus on the costs payable by consumers (see, for example, sections 4AA(1), Gas Act 1986 and section 3A(1), Electricity Act 1989). Considering the critical importance of safety in the context of air traffic control, and the high stakes of any failure to meet such standards, it is vital that the determination of the price control does not adversely affect NERL's ability to maintain these necessarily high standards.

3.4 In exercising its primary duty, the CAA must also have regard to its secondary duties, including inter alia, "*to secure that licence holders will not find it unduly difficult to finance activities authorised by their licences*" (section 2(2)(c), TA2000).

3.5 For the reasons explained below, Heathrow considers that the CAA's RP3 decision was at odds with the CAA's statutory duties to maintain high standards of safety and ensure NERL remains financeable, and in particular that NERL maintain an investment grade issuer rating.[43] These duties apply equally to the CMA in making its re-determination decision and Heathrow submits that to comply with its duties the CMA must take a more balanced and evidence-based approach, especially regarding NERL's WACC.

The CAA must adopt a balanced approach to each aspect of NERL's price control, and in particular WACC, to ensure that consumers and standards of safety are not adversely affected

3.6 The services NERL provide are key to the safety and comfort of air travellers and also to the prosperity of the UK airport industry. To comply with its statutory duties, the CAA was required to strike a balance between setting stretching cost and service targets for NERL and the risk that making the challenges too stretching, or providing inadequate levels of funding, could result in a worse outcome in relation the objectives protected by the CAA's statutory duties. Given that the CAA's primary duty is to safeguard safety, in the case of any doubt or in the exercise of any judgment, the CAA was required to prioritise the solution that leads to greater investment / safety standards rather than simplistic cost-cutting. It is clear that this is not the approach that the CAA followed in making the RP3 decision and therefore the CAA did not strike the balance that its statutory duties required.

3.7 The CAA has stated that "*an effective management team will always prioritise a high standard of safety irrespective of regulatory allowances*".[44] However, this simplistic assumption overlooks the practical realities of running a demanding and evolving

[43] NERL, *Air Traffic Services Licence for NATS (En Route) plc*, November 2019, Condition 5(1)(i) and Condition 5(23).
[44] CAA, *Response to NERL's Statement of Case*, December 2019, para. 7.

regulated business which relies on sufficient financing in order to be able to meet the demands of necessary and objective standards. Even with the most effective and dedicated management team, an under-funded business will not be able to deliver.

3.8 In making its assessment of the correct level of WACC on its redetermination, the CMA must have regard to the same statutory duties as apply to the CAA and therefore must strike a more appropriate balance. If the WACC is set too low, then, although customers may have lower charges in the short term, investment will be unfinanceable and therefore decline. This will result over time in deteriorating service and increased risk, and the consequent loss of value to consumers is likely to outweigh any short-term benefit of a lower charge.

3.9 The importance of the CAA striking the right balance can be quantified by comparing the potential costs of delays against the savings the CAA is trying to make. As set out in paragraph 2.4(a) above, deficiencies in air traffic control can lead to a large number of flights experiencing significant delay. In the UK in 2018 there were almost 2,600,000 delayed flights,[45] with an average of 143 passengers on each flight[46] at a cost of lost time of £44.65 per hour per passenger.[47] For each minute of delay on each of these flights, this equates to £275,132,000.[48] This risk is obviously far in excess of the amounts the CAA is seeking to save[49] and the benefits to consumers from the CAA's proposed cuts are minimal in comparison to the potential downside impact of the cuts resulting in additional delays.

3.10 The CAA appears to suggest that it has been generous by allowing NERL's forecast of capital expenditure in full;[50] however, this overlooks the fact that the RP3 decision should be considered as a package and simply because NERL has been allowed one element of the plan does not mean that the decision is satisfactory as a whole. The CMA must adopt a balanced approach, and this approach should pervade throughout the full decision, including the cost of capital.

The CAA has misunderstood the role of equity

3.11 In its Response to NERL's Statement of Case, the CAA has argued that shareholder return is a reward for good performance: "*we view shareholder returns as the reward for a business that stretches itself to meet efficiency targets*" and "*if NERL is unable to meet efficiency targets, then shareholders should fund the shortfall*"[51]. This approach is misconceived: it is widely accepted that the expected costs of a service are met by customer revenue and equity supports the delivery of the service through the provision of risk capital. Therefore, the cost of equity should reflect the cost of providing equity financing, rather than being primarily considered as a reward for performance.

[45] NERL, *NERL Statement of Case*, November 2019, Figure 11 para. 177.
[46] CAA, More flights and fuller aircraft as UK air traffic continues to grow, https://www.caa.co.uk/Blog-Posts/More-flights-and-fuller-aircraft-as-UK-air-traffic-continues-to-grow/ (accessed 20 December 2019).
[47] Appendix C: ICS Consulting, *Developing the Cost Benefit Analysis Framework Valuations and Initial CBA Results*, July 2019, p. 50.
[48] This is on the basis of 2,600,000*143*44.65/60.
[49] For instance, the CAA is proposing a £71m opex reduction (p. 31 and 33 *NERL Statement of Case*) and £49m capex reduction (p. 32 *NERL Statement of Case*).
[50] CAA, *Response to NERL's Statement of Case*, December 2019, para. 3.
[51] Ibid., paras. 13 and 18.

3.12 The CAA's position that shareholders should fund the shortfall for inefficient costs has been considered and rejected by the CMA previously. In the SONI Final Determination, the Utility Regulator argued that no ex-ante allowance should be given for the risk arising from ex-post inefficient capex disallowances as to do so would mean that the company was being rewarded for being inefficient. The CMA disagreed with this position and recognised the need for there to be a balanced risk and reward profile for SONI's investors. Therefore, as a limited disallowance was reasonably anticipated, the CMA considered that this should be taken into account in the returns required by the regulator (they assumed a 3% disallowance).[52] The overall impact on this decision was that the CMA allowed for the potential inefficiency to be covered by revenue from customers.[53]

3.13 In the approach taken in RP3, the CAA has clearly misunderstood the role of equity, and chosen to adopt an approach which does not recognise the cost to shareholders of providing equity financing. This underlying assumption has made its whole approach to costs unreliable.

The CMA's statutory role and duty is to redetermine the RP3 decision independently

3.14 The CAA Submission states that the CMA should afford the CAA a margin of discretion in its decision-making process.[54] It relies on a recent letter that the CMA sent to Ofgem[55] as evidence that the CMA supports the position that "*regulatory judgments should not be readily dismissed on appeal and that the role of the CMA is not to impose its own solution where a number of alternative solutions are available, and a regulator has acted reasonably*".[56] However, as the CAA itself points out, "*the appeal regime for energy markets has different characteristics*".[57]

3.15 The CAA's reference to the appeals regime in the energy industry is misplaced. This is a re-determination reference of NERL's price control. The process for the CMA in the NERL Reference is more akin to a water sector re-determination as a comparison of the requirements under the Water Industry Act 1991 (***WIA 1991***) and TA 2000 demonstrates.[58]

3.16 The CMA's statutory function and duties in carrying out a redetermination reference are wholly different to the energy appeals regime. Heathrow agrees with NERL in its Statement of Case that the "*CMA's jurisdiction is distinct, free-standing, and exercised afresh*".[59] In that context, there is no role for any "*margin of appreciation*" which could operate to prevent the CMA from exercising its own judgment on the issues in the re-determination. Were the CMA to afford the CAA decision a "*margin of appreciation*" and defer to the CAA without exercising its own judgment, the CMA would not be fulfilling its

[52] CMA, *SONI Limited v Northern Ireland Authority for Utility Regulation: Final Determination,* November 2017, para. 12.109.
[53] Ibid., para. 12.111.
[54] CAA, CAP 1857, *CAA Reference to the CMA of the price controls,* November 2019, paras. 1.17 and 1.18.
[55] CMA, *CMA Response: Clarification of our position on potential Energy Licence Modification Appeals*, 30 October 2019.
[56] CAA, CAP 1857, *CAA Reference to the CMA of the price controls,* November 2019, para. 1.17.
[57] Ibid., para. 1.17
[58] See WIA 1991, section 14 and TA 2000, section 12.
[59] NERL, *NERL Statement of Case,* November 2019, para. 159.

statutory role. Accordingly, any suggestion that the CAA's decision should not be re-examined carefully by the CMA because of a "*margin of appreciation*" afforded to that decision must be rejected.

3.17 On the contrary, the statute requires the CMA to make its decision on all the issues in the re-determination, and particularly on the appropriate cost of capital, independently and in light of its own assessment of all the available evidence before the CMA.

4. The CMA's decision on NERL's re-determination is of particular significance for Heathrow

4.1 Given the parallels that the CAA has explicitly drawn for Heathrow's own regulatory process, the CAA's decision on NERL's re-determination will likely have direct consequences for Heathrow.

The CAA itself has drawn specific links between Heathrow and NERL's cost of capital

4.2 In its RP3 decision the CAA has explicitly drawn links between its approach to NERL's price control for RP3 and its intended approach for Heathrow in the forthcoming H7 price control.[60] The same parallels were also drawn in the CAA's earlier consultation, prior to the RP3 decision.[61]

4.3 Heathrow is concerned that any approach to setting the WACC for NERL at a level which is too low would be regarded by the CAA as equally applicable to Heathrow in H7 with consequent adverse effects on Heathrow's ability to finance its future expansion.[62] Heathrow's recent estimates predict £14 billion for the costs of expansion of Heathrow.[63] Furthermore, Heathrow predicts an overall estimated capex expenditure between 2022 and 2036 of £34 billion (in 2018 prices) in order to deliver expansion, additional capacity and the continued running and maintenance of the existing airport.[64] The way that rating agencies assess credit risks and the need to maintain credit ratings to obtain debt finance means that a lower WACC vastly increases the proportion of financing that needs to be supplied by equity, while at the same time reducing the returns available to it. The real vanilla WACC range suggested for Heathrow in PwC's 2019 report was 2.5% - 3.4%.[65] This poses a fundamental threat to the financeability of Heathrow's expansion.

[60] CAA, CAP 1830A, *UK RP3 CAA Decision Document: Appendices*, August 2019, para. E169.
[61] For example, see the CAA's *Working paper on the cost of capital: the implications of the RP3 draft performance plan for Heathrow Airport Limited (HAL)* (CAP 1762) where the CAA states that the approach to calculating WACC for NERL "*builds on the initial work on the cost of capital for Heathrow Airport Limited (HAL) that we published in December 2017, which was supported by a PwC report (completed in November 2017) that provided initial estimates of the WACC for HAL. Given the links between these workstreams this working paper sets out the implications for HAL of our work on RP3*" (paras. 1.3-1.4). PwC updated their report for Heathrow in February 2019 in light of the updates to RP3.
[62] Heathrow, *Response to CAP1758 and CAP1762*, April 2019, paras. 17 -23.
[63] See Heathrow Expansion FAQs, question 11: https://www.heathrowexpansion.com/faq/ (accessed 23 December 2019).
[64] Heathrow, *Initial Business Plan: Capital Investment Chapter*, December 2019.
[65] PwC, *Estimating the Cost of Capital for H7 - Response to Stakeholder Views, A Report Prepared for the Civil Aviation Authority*, February 2019, p. 14.

Heathrow's Initial Business Plan (***IBP***) shows that at a WACC of 5.0% expansion cannot be financed, and that the expansion can only be financed at a WACC of 6.1%.[66]

4.4 The CAA's determination of the WACC for NERL is based on estimates of several parameters. Heathrow considers that the CAA has made errors in its assessment of a number of these parameters for NERL that are also of material concern for Heathrow and its ability to finance expansion. These parameters include the TMR and asset beta for comparator airports. Heathrow considers that the TMR range suggested for Heathrow in PwC's 2017 report of 5.1% - 5.6%, relied on by the CAA in the RP3 decision,[67] is too low and is not soundly based on evidence. In addition, the CAA's consultants have used a flawed approach to estimate the asset beta of comparator airports to Heathrow, on which the CAA has relied for their estimates of the asset beta of NERL[68].

4.5 Although Heathrow has engaged consistently with the CAA throughout the process leading to the RP3 decision, Heathrow's concerns were not adequately taken into account by the CAA (details of which are set out in Annex I). Heathrow's specific concerns regarding the CAA's estimation of NERL's WACC are set out below in Sections 5 and 6.

The CAA's approach to cost of capital is at odds with recent industry recommendations

4.6 The UK Government's objectives in relation to modernisation align with the National Infrastructure Commission (***NIC***) recommendations to boost UK infrastructure investments for the period up to 2050. The NIC was launched in 2015 to address the lack of a long-term infrastructure strategy in the UK and its recommendation has been to ensure that investment in infrastructure, and in particular transport, continues to grow.[69] In its October 2019 report on the regulated industries of energy, water and telecoms, "*Strategic Investment and Public Confidence",* the NIC have proposed that regulators "*facilitate investment in a strategic way*".[70] This position reflects the UK Government's latest position on prioritising investment in infrastructure, as set out as recently as the Queen's Speech on 19 December 2019.[71]

4.7 Likewise, the Director General of Airports Council International Europe (***ACI***)[72] has recently drawn attention to the lack of investment into transport infrastructure, suggesting that there is a €12.3 billion investment gap over the next five years. This investment gap reflects, inter alia, "*inadequate airport regulation*", in part because airports are unable to attract the investment that they need.[73] The ACI recognises that one of the drivers of modernisation - decarbonisation - cannot be achieved without considerable further investment. Against this background, Heathrow considers that the CAA's approach to

[66] Heathrow, *Initial Business Plan*, December 2019, Chapter 13 Financing, Sections 4 and 5.
[67] PwC, *Estimating the cost of capital for H7 – A report prepared for the CAA*, November 2017, p. 6. See CAP 1830a, *UK RP3 CAA Decision Document: Appendices,* August 2019, paras. E54, E77 and E87.
[68] CAP 1830a, *UK RP3 CAA Decision Document: Appendices,* August 2019, para. E135.
[69] NIC, *National Infrastructure Assessment*, July 2018, p. 71.
[70] NIC, *Strategic Investment and Public Confidence*, October 2019, p.6.
[71] Prime Minister's Office, *The Queen's Speech*, 19 December 2019.
[72] ACI represents the interest of over 500 airports in 46 European countries, including Heathrow.
[73] International Airport Review, *Lack of investment into European airports to affect future development*, 20 November 2019.

NERL's price control, and in particular the WACC estimate, places NERL's ability to receive sufficient investment at risk.

The CAA has taken an approach which is contrary to regulatory best practice

4.8 The UK Regulators Network (***UKRN***) published a report which states that regulators will need to "*balance the need to further the consumer objective and avoid excessive prices for consumers, with the need to ensure that regulated companies can finance the proper carrying out of their functions*".[74] This position is starker when investment has not yet taken place, as the determinantal effect of setting the WACC too low, restricting the opportunity and likelihood of investment, is greater than setting it too high. Therefore, best practice is to use the upper range of estimate for the WACC, and, when significant investment is required, the regulator should adopt the 90th percentile of the regulator's range of estimates of the WACC.[75]

4.9 Oxera has highlighted that there is even greater justification for setting a WACC at the higher end of the range supported by the available evidence where there is:

(a) a material risk of failures which have significant costs (such as the high costs associated with delays explained in paragraphs 2.4(a) and 2.4(b) and inherent safety risks in an industry such as air traffic control);

(b) a material potential for innovation (such as with airspace modernisation);

(c) flexibility to choose the level of investment, where the firm will be more likely to increase investment if shareholders receive higher returns; and

(d) an impact of deferring investment that cannot be adequately reversed after the period.[76]

4.10 Given the significant detrimental effect likely to result from setting a cost of capital that is below the efficient level, regulators have typically complied with their statutory duties, including the financeability duty, by adopting a point estimate between the midpoint and the top end of the range supported by the available evidence. For instance, in the CMA's final determination on Northern Ireland Electricity Limited's (***NIE***) price determination, it considered that to avoid the cost of capital being too low, it was necessary to select a point at the top of the range suggested by the evidence. The evidence in that case supported a range between 3.3% and 4.1% for WACC and the CMA adopted a point estimate of 4.1% as the appropriate level.[77]

4.11 A point estimate at the top of the range is even more appropriate for NERL given the CAA's *primary* duty to maintain a high standard of safety in air traffic service. As explained above, considerable further investment in air traffic control is essential to

[74] UKRN commissioned report, Wright, S, Burns, P, Mason, R and Pickford D, *Estimating the cost of capital for implementation of price controls by UK Regulators, an update of Mason, Miles and Wright (2003)*, 2018, p. 71.
[75] Ibid., p. 72.
[76] Oxera, *Aiming high in setting the WACC: framework or guesswork?,* https://www.oxera.com/agenda/aiming-high-in-setting-the-wacc-framework-or-guesswork/, March 2015 (accessed 27 November 2019).
[77] Competition Commission, *Northern Ireland Electricity Limited price determination: Final determination*, 26 March 2014, p. 13-38 to 13-39.

ensure that it continues to be safe. A choice at the mid- or top-point of the range also aligns with the approach previously taken by the Competition Commission when considering the WACC for UK airports that "*the allowed WACC should be set close to the top of our range*"[78] on the basis of the importance of timely investment and the risk of "*potentially costly financial distress*".[79]

4.12 The CAA has not adopted this well-established best practice approach in RP3. As the CAA Submission states, the appropriate cost of equity for NERL, and in particular the approach that the CAA has taken to choosing the lowest point on its estimates in a number of areas, accounts for the most significant divergence between NERL's estimates and the CAA's.[80]

4.13 The CAA reinforced its position in this regard in its Reply to NERL's submission, stating that they do "*not consider that an explicit adjustment to aim up in setting the allowed WACC is necessary for financeability and such an approach would not be in the public interest*"[81]. The CAA has not justified this view and instead has ignored or rejected the extensive discussion on this point (addressed in paragraphs 4.8 to 4.12 above) and the guidance from UKRN. This represents a serious failure of analysis by the CAA and will not benefit consumers nor be in the public interest.

5. The TMR allowed for NERL of 5.4% by the CAA is based on flawed evidence

5.1 TMR is the expected return on a market portfolio and an example of a market wide parameter that will be common across different companies and sectors when setting the WACC.[82]

5.2 There are two main approaches to estimating an appropriate real TMR:

(a) **Historical approach:** this uses historical realised returns adjusted for inflation to obtain a real TMR. This approach assumes that the historical TMR is a reliable estimate of current investors' expectations of market returns; and

(b) **Forward-looking approach:** this uses a dividend discounting model (whereby the value of the company is the present worth of the sum of all its future dividend payments) to estimate current investors' expectation of market returns. The estimates arrived at by this approach, however, are dominated by assumptions about dividend growth that are not readily observable. As such the historical approach is generally considered more reliable than the forward-looking approach.

5.3 The CAA has used a combination of these two methods, as well as regulatory precedents, in its approach to assessing TMR and then cross-checking each available

[78] Competition Commission, *BAA Ltd, A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd)*, 28 September 2007, para. 4.108.
[79] Ibid., para. 4.106.
[80] CAA, CAP 1857, *Reference to the Competition and Markets Authroity of the NERL RP3 price controls*, 25 November 2019, para. 2.12.
[81] CAA, CAP 1870, *Response to NERL's Statement of Case*, December 2019, p. 78, final bullet point.
[82] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.

method in forming a judgment.[83] Based on its analysis, the CAA decided upon a TMR of 5.4%.[84]

5.4 Heathrow submits that the CAA has chosen a TMR which is demonstrably too low for the reasons explained below, namely:

(a) a misguided reliance on the premise that expected returns are lower than previous price reviews, which is unsupported by any reliable evidence;

(b) reliance on flawed estimates from PwC and UKRN in formulating its view of historical estimates of 5-6% in RPI deflated terms, in particular:

(i) an adjustment for historical inflation which is inconsistent and inaccurate; and

(ii) an arbitrary adjustment between geometric and arithmetical averages; and

(c) failure to take into account robust forward-looking evidence which suggests a much higher range for TMR.

5.5 Further detail on these areas issues is outlined below.

The CAA is incorrect in its assessment that expected returns are lower than previous price reviews

5.6 The market view and precedents on the relevant assessment of TMR in regulated industries support a TMR that is considerably higher than the estimate proposed by the CAA.[85] The CMA decided in each of its decisions in the NIE price determination[86] (26 March 2014) and the Bristol Water plc (***Bristol Water***) price determination[87] (6 October 2015) that 6.5% was the correct TMR value. This TMR figure was also not challenged in the SONI Final Determination in the appeal to the CMA in 2017.[88] These decisions represented a consistent body of evidence-based decision-making by the CMA on the appropriate TMR. Given the consistency of this view from the CMA, any significant change to the TMR would have required particularly strong and compelling evidence supporting the change.

5.7 However, rather than taking due account of these previous decisions and the available evidence, the CAA adopted a significantly lower TMR figure without any robust supporting evidence.

[83] CAA, CAP 1830a, *UK RP3 CAA Decision Document: Appendices*, August 2019, para. E23.
[84] CAA, CAP 1830a, *UK RP3 CAA Decision Document: Appendices*, August 2019, para. E87.
[85] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.1.
[86] Competition Commission, Northern Ireland Electricity Limited price determination: Final determination, 26 March 2014, para. 13.146.
[87] CMA, *Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991: Report*, 6 October 2015, para. 10.185.
[88] NIAUR, *Final Determination to the Price Control 2015-2020 for the Electricity System Operator for Northern Ireland (SONI)*, 22 February 2016, para. 342; CMA, *SONI Limited v NIAUR: Final Determination*, November 2017. TMR was not one of the grounds of appeal in this determination.

5.8 In fact, as shown in NERA's report,[89] there is no evidence capable of supporting the CAA's position, including for the following reasons:

(a) realised returns from major equity markets do not support a trend decline in expected returns. NERA shows that, across five global equity markets, three show an upward trend whilst those in the UK and France do not display a discernible trend. Moreover, NERA notes that for all countries the realised return over the recent period is not statistically different from the long-run average; [90]

(b) forward-looking evidence from the BoE and PwC shows that TMR is stable in the recent period with a 5 year average of 8.8%; [91]

(c) forward-looking survey evidence from over 40 countries from Ferdandez et al. (as quoted by PwC in its report for Ofwat[92]) does not show a reduction in TMR since 2012;[93] and

(d) regulatory precedent from North America shows stable cost of equity allowances for companies subject to economic regulation despite reductions in treasury yields.[94]

5.9 Overall, there is no market evidence to support a decline in either realised or expected returns relative to Q6 / RP2. Heathrow agrees with the additional evidence referred to by NERL in its Statement of Case in the assurance review carried out by Economic Insight which highlights a range of theoretical and empirical studies demonstrating that equity returns are relatively stable in the long-run.[95]

5.10 Accordingly, all reliable available evidence does not support a view that the market expectation of returns has reduced since the CMA made its decisions in 2015, nor since the SONI decision in late 2017. In its reply to the NERL Statement of Case, the CAA now states that "*we are not suggesting that the TMR has fallen by a fixed amount between 2014 and 2019, but rather the balance of evidence is now different, and it is appropriate to reconsider and recalibrate estimates of the TMR on this basis*"[96] – therefore, the CAA itself acknowledges that there has been no fixed decline in the TMR since the CMA considered this issue on numerous occasions previously. The fact that it is instead a matter of judgment shows the inherent uncertainty of the CAA's recent TMR estimates.

5.11 Furthermore, Heathrow agrees with NERL's assessment in its Statement of Case[97] that, as would be the case here, "*any 'large' or 'sudden' changes in TMR should not be*

[89] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 4.2.
[90] Ibid., p. 29.
[91] Ibid., p. 31.
[92] PwC, *Updated analysis on cost of equity for PR19*, December 2017, p. 4.
[93] Ibid., p. 32.
[94] Ibid., p. 33.
[95] NERL, *NERL Statement of Case*, November 2019, para. 557.
[96] CAA, *Response to NERL's Statement of Case*, December 2019, Executive Summary, para. 10.
[97] NERL, *NERL Statement of Case*, November 2019.

considered credible",[98] a position which is consistent with the approach historically endorsed by the CMA in the Bristol Water final determination.[99]

The CAA relies on flawed estimates in formulating its view of historical estimates[100]

5.12 The standard approach to estimating the TMR is to draw on historical realised returns. The CAA relies on misleading estimates from PwC and UKRN in formulating its view of historical estimates of 5 - 6% in RPI deflated terms. The approach taken by the UKRN and PwC in relation to historical estimates of market returns contains a number of shortcomings which mean the conclusions the CAA has reached are not supportable. These shortcomings include:

(a) an inconsistent and inaccurate approach in the adjustment for historical inflation; and

(b) an arbitrary adjustment between geometric and arithmetical averages of historical returns.

5.13 The approach taken by NERA is more reliable and based on:

(a) using the historical RPI index and RPI-CPI wedge to calculate historical CPI deflated returns and convert them to a forward-looking RPI deflated return by applying a forward-looking RPI-CPI wedge; and

(b) applying established methods such as Blume and JKM to estimate returns for long investment horizons/holding periods in line with the CMA approach.[101]

<u>The adjustment for historical inflation is inconsistent and inaccurate[102]</u>

5.14 Nominal returns need to be adjusted by an appropriate inflation estimate to obtain a real estimate on returns. A range of different approaches can be used to make this adjustment. Two important criteria in selecting an approach are that:

(a) the index chosen should be robustly estimated and appropriate for the purpose; and

(b) appropriate account needs to be made of the likely difference between the index and the future path of RPI.

5.15 There are six potential approaches to adjusting the historical return series for inflation:

(a) using historical estimates of CPI to adjust historical returns to obtain a CPI stripped TMR and then applying a forward-looking RPI-CPI wedge to estimate future RPI stripped TMR. This is the approach adopted by UKRN and favoured by PwC;

[98] NERL, *NERL Statement of Case*, November 2019, para. 558.
[99] CMA, *Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991: Report* , 6 October 2015, para. 10.185.
[100] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.2.
[101] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.2.2.1.
[102] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.2.1.

(b) using historical estimates of RPI to adjust historical returns to obtain an estimate of future RPI stripped TMR directly. This is the approach previously adopted by regulators;

(c) using historical estimates of CPI adjusted to correct for errors in the formula effect in historic data to obtain a CPI stripped TMR and then applying a forward-looking RPI-CPI wedge to estimate future RPI stripped TMR. This approach was investigated by Oxera;

(d) using historical estimates of CPI derived from RPI adjusted for changes to the historical wedge between RPI and CPI to obtain a CPI stripped real TMR and then applying a forward looking RPI-CPI wedge to estimate a future RPI stripped TMR. This is an approach adopted by NERA[103];

(e) using historical estimates of RPI adjusted for changes in the series at breaks to estimate the future RPI stripped TMR directly. This is an approach adopted by Oxera[104]; and

(f) using historical estimates of nominal market return and using an estimate of future RPI to estimate RPI stripped TMR. This approach was also investigated by Oxera.[105]

5.16 The different approaches are summarised in Table 1 (below) where the approach has failed one (amber) or two (red) of the criteria set out in paragraphs 5.14(a) and 5.14(b) above:

Table 1: Summary of approaches to estimate real (RPI) TMR[106]

			Approach to inflation			
Approach	1	2	3	4	5	6
	CPI	RPI	CPI adjusted for formula effect in early data	CPI estimated from RPI adjusted for historic CPI wedge	RPI adjusted for historic breaks	Nominal TMR
Average arithmetic nominal return	11.2%	11.2%	11.2%	11.2%	11.2%	11.2%
Adjustment for Inflation	4.0%	4.2%	3.6%	3.2% - 3.7%	4.16% - 4.47%	
Adjustment for future RPI-CPI wedge	1.0%		1.0%	1.0%		
Adjust for future RPI						3.0%
Estimate of real (RPI) TMR	**6.0%**	**6.7%**	**6.4%**	**6.2% - 6.8%**	**6.4% - 6.8%**	**8.0%**
Assessment						

[103] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019.
[104] Appendix D: Oxera, *Estimating RPI-adjusted equity market returns*, August 2019.
[105] Appendix E: Oxera, *Assessment of future total market return*, 20 November 2019.
[106] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.2.1.7.

5.17 The CAA relied on the UKRN equity report[107] where the historical returns are adjusted by historical CPI to obtain an estimate of the CPI stripped real TMR. This is then converted to a RPI stripped estimate of the TMR by adjusting for the expected difference between RPI and CPI. However, this approach fails to meet the criteria in paragraphs 5.14(a) and 5.14(b) and is therefore not reliable. A key implicit assumption in this approach is that the historically imputed CPI series correctly reflects the formula effect that would have been in place if the series had been produced contemporaneously. If this is not the case, then the approach produces an incorrect estimate of the RPI stripped TMR.[108]

5.18 As NERA showed in its response to the UKRN report,[109] and in its updated paper on the cost of equity for Heathrow,[110] there are a number of additional issues with this approach including:

(a) the use of the Office for National Statistics (***ONS***) CPI backcast (which essentially involves forecasting backwards in time) between 1950 and 1988 is problematic:

(i) first, the series is not a national statistic, is not robust and the ONS themselves state caution should be exercised when using them. The RPI series available at the same time was a contemporary national statistic, and therefore should be regarded as being far more robust; and

(ii) second, it is not clear that the relationship between the ONS CPI backcast for CPI and future RPI will be the same as the current relationship between CPI and RPI. As a result, it is not clear what adjustment should be applied to the RPI-CPI wedge for this data and there is no way of robustly deriving such an estimate; and

(b) for the period 1915 to 1949, the CPI and RPI data in the BoE dataset is identical. PwC and the UKRN have treated this data as though it is CPI and will have an identical wedge to RPI as the current CPI-RPI wedge. There is no evidence to support this assumption on the wedge for this period. Moreover, NERA show that this index is closer in nature to RPI than CPI as it was intended to replicate the approach to RPI calculations after 1947 (for example it includes expenditure by UK citizens abroad).[111] Therefore, it is more appropriate to treat it as an RPI estimate from a forward-looking perspective than a CPI estimate.

5.19 NERA shows that the BoE "CPI" data does not represent a historical series of CPI, but instead is a hybrid. By treating it as a CPI series, the CAA's estimate of historical returns is underestimated.[112]

5.20 Oxera also considers that the historic CPI series pre-1988 is not sufficiently robust to implement this approach. In addition, they are concerned that the use of CPI rests on the premise that it is possible to find a reliable estimate of the "formula effect" before 1988.[113]

[107] CAA, CAP 1830a, *UK RP3 CAA Decision Document: Appendices,* August 2019, para. E33.
[108] See also Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.2.1.1.
[109] Appendix A: NERA, *Review of UKRN recommendations on the Real TMR*, June 2018.
[110] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019.
[111] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 4.3.
[112] Appendix B: NERA, *Cost of Equity for HAL in H7*, April 2019, Section 4.3.1.
[113] Appendix D: Oxera, *Estimating RPI-adjusted equity returns*, 2 August 2019.

They conclude that, in the absence of a reliable estimate of the historical difference between RPI and CPI inflation, it is not robust to apply a forecast difference of 1.0% to the historical CPI series.

5.21 Based on the above, it is clear that the CAA's approach is flawed. The CAA has not addressed this issue, despite the point being raised consistently in consultation.[114]

The adjustment between geometric and arithmetical averages is arbitrary[115]

5.22 The average arithmetic return obtained from historical data results in a higher estimate of TMR than the geometric estimate. As a result, there is a debate about the appropriate approach to determining the market TMR. This debate tends to focus on issues such as predictability of returns at longer time horizons and the return that might be expected for an investor with a specific time horizon for holding the stock and is framed around the question of determining the expected return over a specific future period. This is the wrong question. What should be asked is what regulatory WACC should be set so that the resulting series of annual returns over a specific future period produce a return in line with that expected by the market.

5.23 Below, further explanation is provided on:

(a) the approach of UKRN / the CAA in respect of the expected return over a future period and why, even if this were the right question, this approach is not supported by evidence; and

(b) why the regulatory WACC should be based on the arithmetic average return in order to produce expected returns for different holding periods in line with the market.

UKRN / CAA approach to geometric return is misleading[116]

5.24 The UKRN approach explicitly sets out to estimate the return a company would achieve over a long holding period. The report included a downward adjustment of 100 bps from the arithmetic mean to adjust for alleged predictability at long horizons. This adjustment is excessive because:

(a) there is no evidence that there is predictability of returns at longer horizons, and the most recent academic evidence does not support this conclusion;[117]

(b) the UKRN does not specifically calculate the 100 bps reduction, and ignores more established methods developed by Blume[118] or JKM that deal with this adjustment

[114] See Appendix A: NERA, *Review of UKRN recommendations on the real TMR*, June 2018, Section 3; Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, p. 34; Heathrow, *Response to CAP1758 and CAP1762*, April 2019, para. 44.
[115] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.2.2.
[116] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.2.2.1.
[117] See Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 4.3.2; Appendix A: NERA, *Review of UKRN recommendations on the real TMR*, June 2018, Section 4.2 and 4.3.
[118] For example, Blume shows that an unbiased estimate of the expected return over a period of n years is a weighted average of the arithmetic and geometric returns, with the weight given to the arithmetic average being (T+n)(T-1), where T is the number of observations in the time series used to generate the arithmetic and

in a robust statistical manner and that would have produced a much smaller adjustment (10 to 40 bps for a 10-year holding period rather than 100 bps); and

(c) in any case, market evidence shows that typical investor holding periods are less than five years.[119] For instance, NERA presents evidence showing that retail investors typically hold shares for 3 years[120] and pension investors typically have an average holding period of 4.7 years.[121]

5.25 NERA's view is therefore that the most appropriate approach is to estimate likely returns over longer holding periods and to use the established methods developed by Blume and JKM for estimating unbiased estimates of the TMR for long investment horizons that also consider serial dependence. They show that such an approach is consistent with CMA practice and results in a much smaller adjustment than that applied by UKRN.[122]

5.26 In its RP3 proposals for NERL, the CAA does not explicitly address the appropriate process for adjusting for investment horizon. This is a serious weakness in the CAA's approach not only because of the omission, but because it has not justified why they have departed from the consistent approach adopted by the CMA on this issue in the Bristol Water and NIE redeterminations and previous appeals.[123]

5.27 In addition to the error in estimating the likely return for a company over a longer period, Heathrow considers that the CAA approach is wrong in that it has asked the wrong question. Rather than ask what the expected return is for investors with a particular holding period, it should be asking what level of regulatory WACC should be set to ensure that investors obtain a return in line with market expectations.

The WACC should be based on arithmetic average return[124]

5.28 Importantly, when deciding the appropriate use of geometric or average returns in estimating TMR, it is best practice to consider the outcome that is intended. In the case of setting the WACC for a regulated company, these are that:

(a) the estimate is being used to set the expected return for a series of annual returns; and

(b) the outcome intended is that (adjusted for risk) the expected return for investors will be equal to the expected return they would achieve in the market.

5.29 Different investors will hold the investment for different lengths of time. To meet the second requirement, a regulator should ensure ideally that the expected return over the time horizon of each investor was consistent with the market expectation of returns for the

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geometric average and n is the period over which the return is to be estimated. For a 120-year series, estimations for periods of fewer than ten years are therefore very close to the arithmetic average.

[119] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 4.3.3.

[120] The Investment Association, *Asset Management in the UK 2017-2018: The Investment Association Annual Survey*, September 2018, p. 71.

[121] Schroders, *Global Investor Study 2016 – Plan Sponsors*, 2016, pp. 4-5.

[122] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 4.3.2.

[123] Competition Commission, *Northern Ireland Electricity Limited price determination: Final determination*, 26 March 2014, Table 13.7, p. 13-27.

[124] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.2.2.2.

investment over that specific time horizon. The evidence demonstrates that the regulatory WACC should be based on the arithmetic average return.

5.30 The arithmetic mean return is an unbiased estimate of the return that would be expected in one year. Consequently, an investor holding a share for one year would expect a market return equal to the arithmetic average return and therefore basing the WACC on the arithmetic average would result in the one year investor's expectations being met. An investor holding a share for a longer period would expect a slightly lower average cumulative return as the expected outturn geometric return achieved by the regulated company would be lower than the arithmetic average as a result of returns varying from year to year. The question at issue is at what level the WACC should be set to achieve this expected cumulative return over the longer period.

5.31 Since the WACC is being set to produce a series of annual returns around which there is risk, the compounded geometric return will be less than the return used to set the WACC. A report by Cooper[125] shows that for longer time horizons, the level at which the WACC would need to be set to achieve market expected returns for that longer period must be greater than the arithmetic average and increases for longer periods.[126] In practice, for shorter holding periods of up to five years, the required margin over the arithmetic mean is small and therefore the arithmetic mean remains an appropriate basis for setting WACC for holding periods up to five years.[127]

5.32 Although the expected return over a longer period depends upon assumptions around predictability of returns or the specific time-horizon, this does not require a different approach to setting WACC. This is because a WACC based on the arithmetic average would produce the right expected return over longer periods irrespective of these issues. This is true unless the risk adjusted variability of returns of the company were different to the variability of the market. However, if this were the case, then the capital asset pricing model would not be valid as the company would have a source of expected return risk not captured by beta.

5.33 Instead, consider an approach where the WACC was based on the expected compounded return over a five-year period (i.e. lower than one based on the arithmetic average). This would result in an expected return that was too low for a 1-year investor as it would be below the expected market return for a one year holding. It would also be too low for an investor holding the share for five years. This is because variations in return in each year as a result of external market variability means that the expected compounded return of the investment over five years would be below the set WACC despite it being intended to reflect a five-year holding period. In other words, all investors irrespective of holding period would receive expected returns below expected market returns as the WACC would be set too low. This demonstrates that the regulatory WACC should be based on the arithmetic average return.

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[125] Ian Cooper, *Arithmetic versus geometric mean estimators: Setting discount rates for capital budgeting*, European Financial Management, Vol. 2, No. 2, 1996.

[126] This is because variations in return around a mean always result in a lower geometric mean. This can be seen simply by considering two years where the returns are (r+d) and (r-d). The arithmetic return is r, but the geometric return is sqrt(r^2 -d^2) which is always less than r.

[127] Ian Cooper, *Arithmetic versus geometric mean estimators: Setting discount rates for capital budgeting*, European Financial Management, Vol. 2, No. 2, 1996.

The CAA has failed to take into account robust forward-looking evidence which suggests a higher TMR[128]

5.34 Forward looking approaches attempt to capture current market participant expectations of future equity returns by using current market data and forecasts. They can be produced to provide a cross-check with historically derived estimates. The standard approach to obtaining a forward-looking approach is to use dividend discount models.

5.35 There is robust published forward-looking evidence – including from the BoE and Bloomberg – which suggests that an appropriate range for a forward-looking estimate of the TMR is 7.2% - 9.7%. The CAA has not taken account of this evidence and their TMR appears considerably lower than the market:

Table 2: Forward-looking estimates of TMR

Source	Low	High
CAA	5.0%	6.0%
PwC for CAA	5.1%	5.6%
Bank of England	7.2%	8.1%
Bloomberg	8.0%	9.7%

Source: CAA / NERA[129]

5.36 The BoE has stated that they consider their series produces accurate equity risk premium estimates.[130]The CAA's range is clearly inconsistent with this evidence. In addition, the higher Bloomberg estimates show that the BoE estimate is conservative compared to other market participants.

5.37 The difference in the estimates arises because the different approaches make different assumptions about market expectations of future returns. In particular, the dividend discount approaches adopted in those reports that the CAA relies upon (PwC, CEPA, and Europe Economics (***EE***) for Regulators) suffer from a major weakness in that they do not use reasonable market expectations to produce their estimates. This in turn means that their estimates do not reflect market views and therefore cannot be regarded as contemporaneous view of likely market returns. There are two key issues:

(a) firstly, the PwC approach uses GDP growth estimates in the short term rather than analysts' expectations of dividends.[131] There is no evidence that short run GDP growth rates are related to market expectations of dividend growth. However, dividend growth expectations are captured by analyst forecasts, and therefore investors will take them into account in their expectations of market returns. Consequently, an estimate of the expected dividend growth rate of the UK market must account for analysts' estimates of dividends in the short term; and

[128] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.3.
[129] This is included at Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.3.
[130] Bank of England, Quarterly Bulletin, *An improved model for understanding equity prices*, 16 June 2017, pp. 92-4.
[131] PwC did not present any further arguments or analysis in its August 2019 consultation paper (*Estimating the cost of capital for H7 and RP3 – Response to stakeholder views on total market return and debt beta*, August 2019, pp. 19-20), but rather restated its position which has been addressed by NERA - Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 4.4.

(b) secondly, PwC relies solely on UK GDP forecasts to estimate longer term dividend growth. However, over 70% of UK listed earnings come from overseas. Investors will therefore consider that global growth rates are relevant for dividend growth in the UK and take it into account in their expectations of market returns. Consequently, an estimate of the expected dividend growth rate of the UK market must take account of global growth as well as UK growth. Oxera also agree this approach is incorrect.[132]

5.38 PwC argues that it is appropriate to use only UK GDP growth as they are producing estimates for UK companies. Heathrow considers this argument is flawed. Although using UK GDP growth might be appropriate in the event of undertaking a dividend discount model calculation for a specific single UK company with little international exposure, it is not correct to use it for estimating the dividend growth of the UK market overall, which does have significant international exposure. It is irrational to assume that investors in the UK stock market will not take account of potential global growth in their return expectations. Similarly, it is not rational to assume that investors in UK aviation (for instance those looking to invest in companies such as NERL and Heathrow) will ignore global growth and take account only of UK growth.

5.39 In summary, therefore, Heathrow concludes that the appropriate range of forward-looking estimates of a real (RPI stripped) TMR is 7.2% - 8.1% in line with the BoE.[133]

Further methodological issues with PwC's approach to dividend discount model, upon which the CAA rely

5.40 PwC sets out in its August 2019 paper to the CAA further explanations as to why they are content with their analysis, despite the issues that have been highlighted in consultation. PwC's explanation in particular for dividend discount model remains unsatisfactory for the reasons set out below.

5.41 Firstly, PwC argues that the use of analyst forecasts is not appropriate for regulatory forecasts as they have been found to be both biased and inefficient.[134] They refer to BoE evidence that analyst forecasts of dividends three years ahead are too optimistic ahead of downturns and too pessimistic during recoveries. However, PwC provides no analysis to show whether UK GDP forecasts are better forecasts of dividends than analysts' reports over this period. Furthermore, much of PwC's other evidence relates to the accuracy in predicted earnings, not on the accuracy of predicted dividends that are relevant for dividend discount model estimates. Dividends tend to be much less volatile than earnings, and companies often give forward guidance on the likely path of dividends, which improves analyst forecasts compared to earnings.

5.42 Secondly, PwC argues that as they are setting longer-term parameters they do not require a model that picks up high frequency variations in analyst return expectations.[135] However, a discount dividend model approach is based on current market prices which

[132] Oxera, *The cost of equity for RIIO-2*, November 2019, Section 2.3.
[133] NERA, *Cost of equity for Heathrow in H7*, February 2018, Section 2.2.2.
[134] PwC, *Estimating the cost of capital for H7 and RP3 – Response to stakeholder views on total market return and debt beta*, August 2019, p.5.
[135] Ibid.

themselves show high frequency variation. In addition, if a company were to issue a profit warning or guidance on dividends then this would affect both its share price and analysts' forecasts of that company's dividends. A methodology to calculate TMR that reflects only one of these changes would therefore have an erroneous estimate. Consequently, given the high frequency variation of stock prices, it would be inappropriate to use a dividend forecasting approach such as estimates of GDP growth that did not reflect factors driving the variations in price.

5.43 Thirdly, PwC also argues that the range in future dividend forecasts from -15% in 2009 to +17% in 2011 means that such forecasts are unsuitable for use in a dividend discount model.[136] However, this is in direct opposition to the evidence PwC relied on earlier that estimates were too optimistic in a downturn (2009) and too pessimistic in an upturn (2011). If the estimate of -15% in 2009 was too optimistic and the estimate of +17% in 2011 too pessimistic then it is not reasonable to argue the range in the estimates itself undermines their use.

The evidence range supports a higher TMR[137]

5.44 The approach taken by the CAA is flawed both in its historic and forward-looking estimates. In addition, given the lack of market movement since the previous CMA decision, the TMR level set by the CMA remains a robust estimate and suitable for setting regulatory WACC. The CAA has agreed with this point in its Reply to NERL's Statement of Case, stating that there is not any evidence to suggest that TMR has fallen by a fixed amount between 2014 and 2019.[138]

5.45 The review of the historical evidence identified a range for real (RPI stripped) TMR of 6.0% - 8.0%. The forward-looking range of 7.2% - 8.1% overlaps the top end of this range, demonstrating the historical range is accurate. The lower end of this range is also consistent with recent CMA precedent.

5.46 The resulting TMR is capped at the range of the decision of the CMA in 2014/15 the 2014 NIE appeal[139] and 2015 Bristol Water decision[140] of 5 - 6.5%[141]:

(a) NERA is 6.2 - 6.8% (arithmetic) based on a CPI/RPI hybrid;[142]

(b) Oxera is 6.4 - 6.8% (arithmetic) based on a corrected RPI series;[143] and

(c) Oxera is 6.4% on a corrected CPI series (new assessment done for energy companies).[144]

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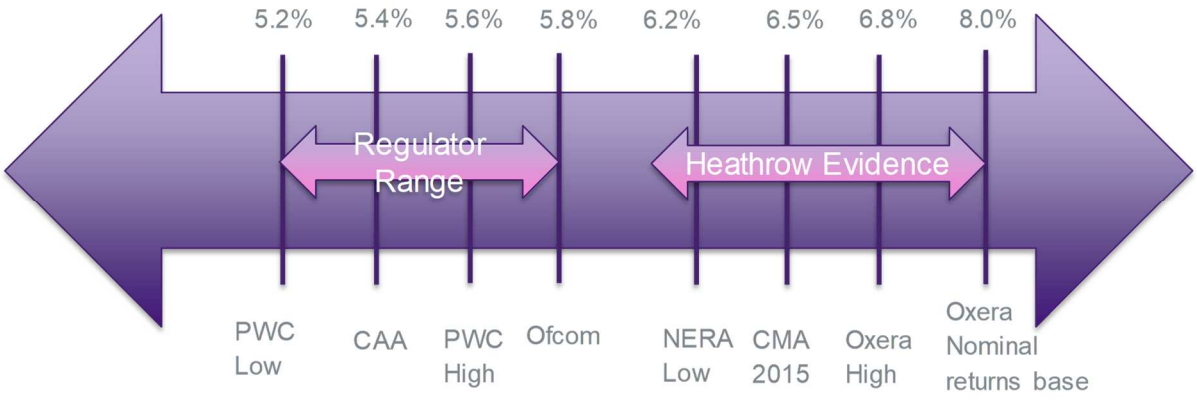
[136] Ibid.
[137] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.4.
[138] CAA, CAP 1870, *Response to NERL's Statement of Case*, December 2019, para. 10.
[139] Competition Commission, *Northern Ireland Electricity Limited price determination: Final determination*, 26 March 2014, Section 13.
[140] CMA, *Bristol Water plc: A reference under section 12(3)(a) of the Water Industry Act 1991: Report*, 6 October 2015.
[141] Competition Commission, *Northern Ireland Electricity Limited price determination: Final determination*, 26 March 2014, Section 13, para. 13.147.
[142] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, page 27.
[143] Appendix D: Oxera, *Estimating RPI-adjusted equity market returns*, August 2019, page 37.

5.47 The market moves show that the figure should not be lower than last time and perhaps marginally higher, and the evidence range supports a current view of 6.5% - 6.75%[145].

5.48 Figure 1 below demonstrates the range of estimates for TMR currently:

Figure 1: Range of estimates for TMR[146]



5.49 In the CAA s Response to NERL s Statement of Case, it presents a summary of TMR estimates. This purports to demonstrate the revised RP3 estimate as an outlier, whilst its RP3 decision in August 2019 is in the range of other published estimates by regulators (including Ofwat and Ofgem).[147] However, the CAA has drawn on largely the same analysis and consultants as Ofwat and Ofgem in their decisions. It is also a selective set of sources which are self-serving: for instance, the CAA has not included the CMA's decisions from NIE, Bristol Water and SONI, nor does it include the submissions of the energy companies in December 2019. Therefore, it is not surprising that CAA's estimate falls within the range presented by other regulators which are, themselves, based on the work of the same consultants in each case. This does not mean that the most recent proposals by other regulators can be viewed as a genuinely independent check and verification of the CAA's proposals. On the contrary, they are not properly independent as they have been supported by the same advisers.

5.50 Further, as set out above, the ex-post and forward looking datapoints in the CAA's summary have a downward bias. Once this is amended as suggested by the analysis above, NERL's revised RP3 estimate would be in line with other estimates.

[144] Oxera, *The cost of equity for RIIO-2,* November 2019: figure based on estimate of 7.41% CPIH from page 17, after removing the 1% wedge between RPI and CPIH.
[145] The bottom estimate of 6.5% is based on CMA past estimate and the top of the range is consistent with the top of the range provided by NERA and Oxera (see para. 5.46).
[146] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, para. 2.2.4.
[147] CAA, CAP 1870, *Reference to the CMA of NERL RP3 price controls: CAA response to NERL's Statement of Case*, November 2019, Figure 9.11.

6. The asset beta of 0.46 for NERL in the RP3 decision is based on fundamental errors of assessment

6.1 Asset beta is the measure of market risk of a company without the impact of debt, so isolates the risks in the company's assets alone. In RP3, the CAA adopted an asset beta of 0.46.[148] Although a company-specific measure, in the RP3 decision the asset beta for NERL was apparently considered appropriate given that it is slightly below the mid-point of PwC's estimated range for Heathrow of 0.42 - 0.52.[149] To the extent that the CMA considers this comparison as a sense check, the figures that the CAA use for Heathrow are not representative and are too low. Overall, Heathrow considers that the CAA has included a number of methodological flaws in its approach to calculating asset beta, and that the appropriate range of asset beta for Heathrow is 0.54 - 0.62.[150] Specifically, Heathrow considers that:

(a) relevant airport comparators indicate a much higher asset beta for Heathrow;

(b) the CAA has adopted a flawed approach in its estimates of comparator airports, primarily due to the inclusion of Large Cap index estimates; and

(c) the CAA estimates do not give sufficient recognition to systematic risk factors.

6.2 As a sense check, it is also worth noting that the CAA estimates for overall cost of equity for Heathrow are well below international comparators, as explained in more detail below.[151]

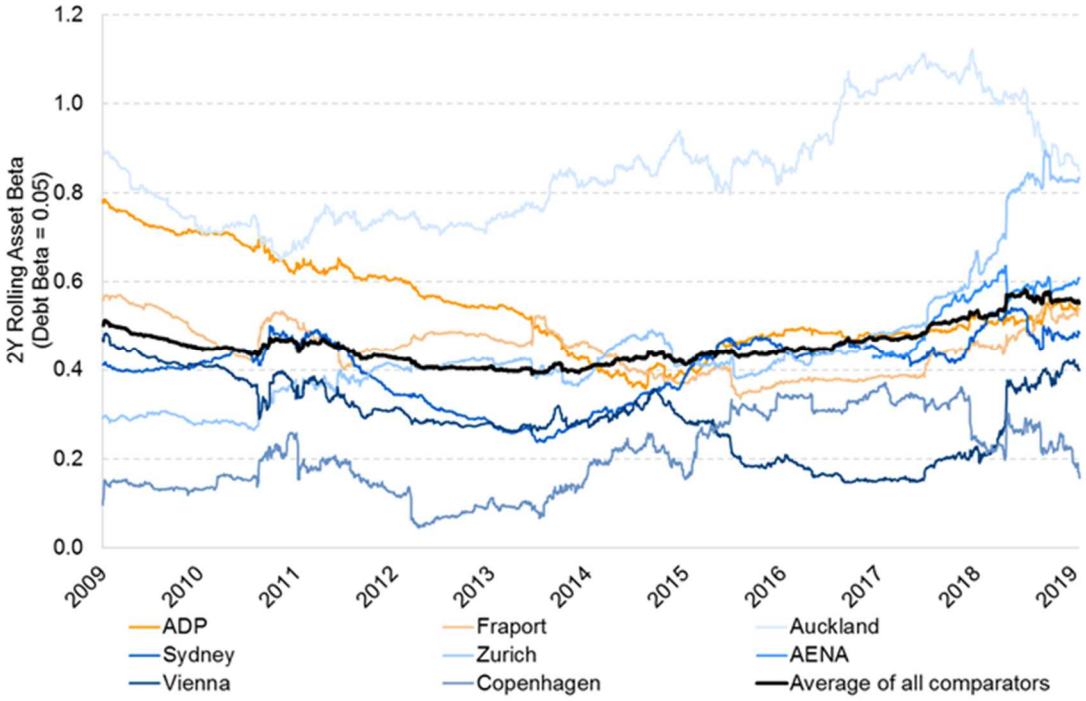
Asset beta in comparator airports are significantly higher than the current estimates for Heathrow

6.3 Although a company-specific measure, the CAA appears to have drawn links between the asset beta for NERL and Heathrow. In the RP3 decision, the asset beta for NERL is compared to PwC's estimated range for Heathrow: "*[m]oreover, the asset beta is slightly below the mid-point of PwC's estimated range for HAL (0.42-0.52, based on 2-year daily and 5-year monthly asset betas for ADP and Fraport, measured against both local and European indices), so seems to be broadly consistent with Europe Economics' conclusion that NERL's asset beta should be below that of UK airports*".

6.4 However, there is strong evidence that airport asset betas have been increasing over the last five years and that the average asset beta for airports over the last two years is much higher than PwC's estimated range for Heathrow.[152] On behalf of Heathrow, NERA undertook a study to determine the asset beta of a range of comparator airports around the world based on data up to the end of March 2019.[153] The results are shown in Figure 2 below.

[148] CAA, CAP 1830a, *UK RP3 CAA Decision Document: Appendices*, August 2019, para. E133.
[149] Ibid., para. E135.
[150] Assuming a debt beta of 0.1. See Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, section 2.4.4.
[151] Also see Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, section 2.4.
[152] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Table 2.5.
[153] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019.

Figure 2: Asset betas of comparator airports[154]



Source: NERA

6.5 Figure 2 shows that airport asset betas have been increasing over the last five years, and that the average asset beta for airports over the last two years is 0.58.

6.6 The key comparators are Fraport and AdP (which includes Paris Charles de Gaulle (***CDG***)) as they are large regulated hub airports. Table 3 sets out the asset betas estimated by NERA for AdP and Fraport.[155]

Table 3: Estimated Asset Beta for AdP and Fraport[156]

Asset Betas (debt beta 0.05)[157]	**1-year**	**2-year**	**5-year**
AdP	0.51	0.60	0.54
Fraport	0.55	0.59	0.47

Source: NERA based on data to March 2019

6.7 The key airports for these companies are Frankfurt (for Fraport) and CDG for AdP. These are both major hub airports which represent over 80% of the revenues of each group and therefore appear to be reasonable comparators for Heathrow for this purpose.

[154] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, Figure 5.
[155] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Table 2.6.
[156] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, Table 4.
[157] A debt beta of 0.1 is at the top end of what is reasonable and the CAA are ignoring empirical evidence to that effect.

6.8 In its 2018 report, NERA set out a comparative risk assessment of Heathrow, Frankfurt and CDG airports.[158] This showed that Heathrow was riskier than Frankfurt Airport, and at least as risky as CDG.[159] PwC also assessed the relative risk of Heathrow to these airports,[160] and it concluded that Heathrow is of comparable risk to CDG and Frankfurt. Drawing on the asset beta estimates for AdP and Fraport, based on a debt beta of 0.05, NERA concluded that the appropriate range for the asset beta of Heathrow is 0.55 - 0.6.[161]

6.9 This point, and the fact that the UK aviation industry and the UK economy are intimately linked through the Brexit negotiations (which clearly have their own related volatility risks), means that it is not correct to suggest that the UK aviation industry (both Heathrow and NERL included) do not face demand volatility risks.

The CAA's advisers underestimate Heathrow's asset beta due to methodological shortcomings

6.10 When considering the approach for Heathrow's asset beta, the CAA's advisors – PwC and EE – refer to comparators such as Fraport and AdP (which includes CDG), i.e. large regulated hub airports in Europe. However, in doing so, although EE provides certain reasonable estimates of asset beta from the European index (***Stoxx Europe 600***), its conclusions are wrong because they use the Large Cap indices for France (***CAC40***) and Germany (***DAX***) and weigh both evenly.[162] This leads to an underestimation of the asset betas. This underestimation is due to various shortcomings in their method of calculation, including that the local Large Cap indices used by EE and PwC provide an unreliable method to derive asset betas for AdP and Fraport. These shortcomings are explained in further detail below.

<u>The CAA's advisors rely on estimates of asset beta for Fraport and AdP</u>

6.11 In PwC's February 2019 paper,[163] PwC argues for maintaining an asset beta range for Heathrow of between 0.42 - 0.52 for H7, in line with the range used in the Q6 price control. PwC bases its estimate of Heathrow's asset beta on its estimated beta for AdP and Fraport, measured against both local and European indices. PwC takes an average of these values over both two-year and five-year estimation periods to derive an estimated beta of 0.43 for Fraport and 0.51 for AdP.[164]

6.12 In EE's December 2018 report for the CAA,[165] EE estimates an asset beta of 0.48 for Fraport and 0.55 for AdP. EE calculates the airport betas based on the two-year equally

[158] NERA, *Cost of Equity for Heathrow in H7: A Report for Heathrow Airport*, February 2018.
[159] See also Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 2.2.3.
[160] PwC, *Estimating the Cost of Capital for H7 - Response to Stakeholder Views, A Report Prepared for the Civil Aviation Authority*, February 2019, p. 69.
[161] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 2.4.
[162] Europe Economics, *Components of the Cost of Capital for NERL*, December 2018.
[163] PwC, *Estimating the Cost of Capital for H7 - Response to Stakeholder Views, A report prepared for the Civil Aviation Authority*, February 2019, p. 13.
[164] Ibid., para. 5.222.
[165] Europe Economics *Components of the Cost of Capital for NERL*, Appendix 8: Analysis of HAL's Beta, December 2018, p. 81.

weighted average unlevered beta, where equal weight is given to betas calculated using a domestic index and a European index.

6.13 The differences between NERA's, PwC's and EE's estimates are summarised in Table 4 below.

Table 4: Alternate estimates of comparator asset betas[166]

	PwC	EE (2 year)	NERA (2 year)
AdP	0.51	0.55	0.60
Fraport	0.43	0.48	0.59

Source: PwC/EE/NERA

6.14 The significant divergence in asset betas between the consultants is derived largely from the local Large Cap indices used by EE and PwC which provide an unreliable method to calculate asset betas for AdP and Fraport, as explained below.

The CAA has erroneously included local Large Cap index estimates

6.15 In assessing asset beta for comparators, both PwC and EE use the domestic Large Cap indices for France (CAC40) and Germany (DAX) as the respective domestic indices for AdP and Fraport, and use the Stoxx Europe 600 as the European index for both. They take an average of the beta estimates used in both approaches to obtain their beta estimate overall.

6.16 However, the inclusion of estimates from the local indices is not appropriate. The asset beta should be calculated using the investment universe of the marginal investor in the company. The marginal investor is defined as the investor who is most likely to buy/sell the asset, and hence whose behaviour affects the share price and, as a result, the beta of the asset. Once the marginal investor in the company is identified, the stock market index should represent the investment universe available to the marginal investor to diversify its portfolio of assets. NERA demonstrates that the local Large Cap indices are not representative of the investment universe of the marginal investor in these companies[167]:

(a) AdP and Fraport are not constituents of the local Large Cap indices used, and therefore by definition the indices do not represent the investment universe of the marginal investor; [168] and

(b) the marginal investors in AdP and Fraport are international institutions holding a geographically diversified portfolio of assets. The appropriate investment universe for this type of investor is wider than just the country in which this specific asset is located. For this reason, local stock market indices are not representative of the investment universe of the marginal investors in the two companies.[169]

[166] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, Table 5.
[167] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 2.
[168] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 2.2.1.2.
[169] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 2.2.1.1.

6.17 Heathrow commissioned Economic Insight to examine the investment universe of the marginal investors in AdP and Fraport. Economic Insight showed[170] that:

(a) AdP's equity holders are geographically dispersed and hold geographically dispersed portfolios. Other than the state, the majority of the shares are held by non-resident institutional investors, who are shown to have no bias in the allocation of their investments and demonstrate a large degree of switching between both countries and companies; and

(b) the same is true for Fraport; its equity investors are geographically dispersed and hold geographically diversified portfolios.

6.18 Since the local Large Cap indices are not representative of marginal investors in AdP and Fraport, these indices should not be used for estimating the beta of these companies. Economic Insight argue that the beta of these airports should be based on broader European or potentially global stock indexes.[171]

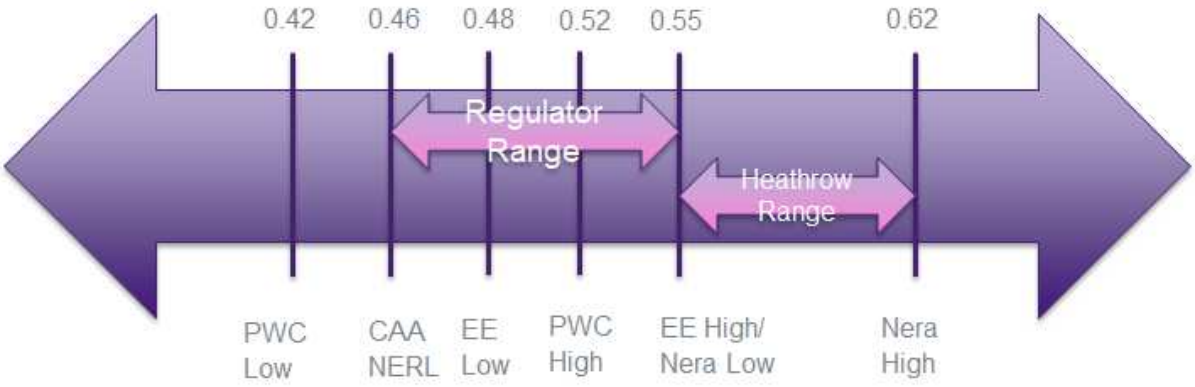
6.19 NERA also argues that since the purpose of using comparator airport betas is to assess the correct beta for Heathrow, it follows that the stock market that is being used as a reference market should be similar in terms of relative risk and stock composition to the UK stock market. They show that the make-up of the Stoxx Europe 600 index is similar to the FTSE All Share index. In contrast, the CAC40 and DAX indices differ considerably from the FTSE All Share[172]. They conclude that to ensure that AdP and Fraport beta estimates are relevant to the beta risk faced by Heathrow investors, it is imperative to use the wider Stoxx Europe 600 index. Heathrow notes that, in excluding asset betas based on the local index, EE and NERA produce similar estimates for asset beta.[173] PwC's estimate is significantly lower, but this reflects shortfalls in the robustness and accuracy of PwC's approach more widely.[174]

Correcting the calculation on asset beta

6.20 Figure 3 below sets out the range of estimates for Heathrow's asset beta based on a debt beta of 0.1. It shows a significant divergence in the range from the CAA's advisors to the range identified by NERA.

[170] Appendix G: Economic Insight, *Local Large Cap vs Euro Indices for Beta estimation*, December 2019.
[171] Appendix G: Economic Insight, *Local Large Cap vs Euro Indices for Beta estimation*, December 2019, p36.
[172] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Section 2.2.1.3
[173] Appendix B: NERA, *Cost of Equity for HAL at H7*, April 2019, Table 2.1.
[174] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, Section 2.4.2.1.

Figure 3: Range of views on asset beta[175]



CAA estimates for cost of equity are well below international comparators

6.21 As a cross-check, Heathrow has compared its estimated range of cost of equity to that of other regulated and infrastructure companies globally. NERA has conducted a review of the international cost of equity decisions for regulated companies operating in the energy and airport sectors[176]. It shows that:

(a) US rate decisions for regulated utility companies have been stable over time, despite substantial reductions in US treasury yields. The median allowed return on equity was remarkably stable at around 10% (nominal, pre-tax, or around 7% real (RPI) on a post-tax basis); and

(b) decisions on regulated airports show an average real cost of equity of 9.1%. Asset betas have been increasing over this period, and this average does not reflect the latest values. This is equivalent to 8.1% on an RPI basis (9.8% on a pre-tax RPI basis).

6.22 These benchmarks demonstrate the level of returns available to international investors. Heathrow's expansion will require additional equity from its shareholders. They will only invest in Heathrow if the risk adjusted returns from Heathrow are expected to be better than those available to them from other potential investments they might make elsewhere in the world. This means that these airport benchmark rates, adjusted for risk, should be considered a floor on the cost of equity for Heathrow.

6.23 Table 5 below sets out the real RPI stripped cost of equity for international comparators alongside the estimates of Heathrow and PwC. US regulated utility companies are widely regarded as relatively low risk and therefore their cost of equity would be expected to be well below that of an airport.

[175] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, Figure 6.
[176] NERA, *International precedent on cost of equity: A Report for Heathrow Airport*, February 2018.

Table 5: Comparison of benchmarks with Heathrow and PwC estimates of cost of equity[177]

	US regulated utility	International airports	Heathrow range	PwC range
Estimated Range	7.0%	8.1%	7.5% 9.6%	4.4% 6.6%

Source: Heathrow/Nera/PwC

6.24 Table 5 shows that the Heathrow range is consistent with the international benchmarks. The bottom of the range is above the cost of equity of the lower risk US regulated utility companies, and the range brackets evidence for international airports.

6.25 Table 5 shows conversely that the PwC estimates of the cost of equity are well below the international comparators. Indeed, the top of the PwC range is well below the cost of equity for lower risk US energy companies. This demonstrates that the PwC estimates are divorced from market reality and should be discounted.

The CAA's asset beta cross check is flawed

6.26 In the CAA's Response to NERL's Statement of Case, the CAA argues that NERL would be less risky than the market average given it is a regulated monopoly, and as 'sense check' of its conclusions, the CAA have stated that it is unlikely NERL would have an equity beta higher than 1.[178]

6.27 Firstly, evidence previously produced by PwC[179] for the CAA that shows there is no 'rule' that airport equity betas have to be lower than a specific number (for instance, equity beta of 1 or the equity beta of airlines). The CAA is in error in comparing the equity beta of companies as a way of comparing their underlying risk. The equity beta reflects both the underlying risk of a company and its gearing. A high equity beta may be a result of high gearing and low underlying risk, or low gearing and high underlying risk. To compare underlying levels of risk the CAA should instead compare the asset beta of NERL with those of other companies or sectors.

6.28 Secondly, and in any event, the CAA has not reported the equity betas of IAG and Easyjet correctly.

(a) The two-year equity betas of IAG and Easyjet are 0.97 and 0.98 respectively.[180] Moreover, the gearing of these companies (net debt) / (net debt + market cap) is much lower than NERL's notional gearing level. Based on their latest public accounts, the gearing of IAG at 31 December 2018 was 0.35 and Easyjet as at 30 September 2019 was 0.22.[181] Based on these gearing levels, the asset beta of IAG is 0.62 and Easyjet is 0.76 (assuming a debt beta of zero).

(b) The CAA estimate for the asset beta of NERL is 0.46 (based on a debt beta of 0.1). On an equivalent basis to the estimates of IAG and Easyjet above with a debt beta of zero, the asset beta used by the CAA for NERL is 0.40. Therefore, contrary to

[177] Appendix F: Heathrow, *Initial Business Plan: WACC Chapter*, December 2019, Table 9.
[178] CAA, CAP 1870, *Response to NERL's Statement of Case*, December 2019, paragraph 9.31 to 9.33.
[179] PwC, *Estimating the cost of capital in Q6 for Heathrow, Gatwick and Stanstead*, April 2013, Figure 7.10.
[180] Heathrow calculation using OLS and daily data relative to FTSE all-share on 19 December 2019.
[181] Heathrow calculation.

the CAA's assertion that its assessment of beta means that NERL is higher risk than these airlines, the approach the CAA has actually taken is to assess NERL as being much less risky.

6.29 The CAA has relied on its overall sense-check on equity beta to support its estimate of the asset beta for NERL. However, it is clear that the CAA has based the sense-check on incorrect data and assumptions. Given this conclusion, we consider that the CAA judgement on this parameter cannot be relied upon.

ANNEX I

1. Heathrow's engagement with the CAA

1.1 Heathrow has engaged with the CAA from the outset in the determination of NERL's cost of capital. Following the CAA's publication of its RP3 proposals for NERL[182] in February 2019, Heathrow has proactively sought to put forward Heathrow's views on the CAA's RP3 proposals which the CAA has said will have "*significant read across to Heathrow's own regulatory framework or to airspace issues which impact our current and/or future operations*".[183]

Date	Event	Document
November 2017	PwC publishes Estimating the cost of capital for H7 – A report prepared for the CAA	PwC - Estimating the cost of capital for H7 – A report prepared for the CAA
December 2018	Europe Economics publishes Components of the Cost of Capital of NERL	Europe Economics - Components of the Cost of Capital of NERL
13 February 2019	CAA publishes RP3 Draft Determination	CAP1758
February 2019	CAA publishes working paper on the cost of capital: the implications of the RP3 draft performance plan for HAL	CAP1762
February 2019	PwC publishes Estimating the cost of capital for H7 - Response to stakeholder views	PwC - Estimating the cost of capital for H7 - Response to stakeholder views
12 April 2019	NERL responds to Draft Determination (CAP 1758)	Response to CAP1758
16 April 2019	Heathrow responds to CAP 1758 and CAP 1762, accompanied by two economist reports: • NERA, Cost of Debt for HAL in H7, April 2019. • NERA, Cost of Equity for HAL in H7, April 2019.	Response to CAP1758 and CAP1762
6 June 2019	Europe Economics publishes comments on NERA/NERL critiques	Europe Economics - Comments on NERA/NERL critiques

[182] CAA, CAP 1758, *Draft UK Reference Period 3 Performance Plan proposals*, February 2019.
[183] Heathrow, *Response to CAP1758 and CAP1762*, April 2019, para. 11.

	of Europe Economics' WACC analysis	
August 2019	PwC publishes Estimating the cost of capital for H7 and RP3 - Response to stakeholder views on total market return and debt beta	PwC - Estimating the cost of capital for H7 and RP3 - Response to stakeholder views on total market return and debt beta
29 August 2019	CAA publishes final decision and appendices	CAP1830 CAP1830a
10 September 2019	NERL sends letter rejecting determination	Letter to CAA re: CAP1830
25 November 2019	CAA reference to the CMA of the price controls published	CAP1857
2 December 2019	NERL Statement of Case published	NERL Statement of Case
18 December 2019	CAA reply to the Statement of Case published	CAA response to NERL's Statement of Case

1.2 Heathrow's engagements with the CAA have consistently shown the CAA that the low levels of cost of capital set out in the CAA's draft proposals are unlikely to be consistent with financing the expansion of Heathrow airport and airspace modernisation.

1.3 Heathrow is also engaged with the CAA in relation to its own business plan for H7. As set out in Section 3, the approach to cost of capital and the importance of getting the balance right in the range of WACC is fundamental if Heathrow is to achieve expansion at Heathrow. Heathrow's involvement in the NERL Reference is therefore in addition to engagement with CAA on its own cost of capital.

ANNEX II

1. Glossary of Defined Terms

Defined term	Definition
A4E	Airline for Europe
ACI	Airports Council International Europe
AdP	Groupe ADP, who manage Paris-Charles de Gaulle, Paris-Orly and Paris-Le Bourget airports.
AMAN	Arrivals manager systems
BoE	Bank of England
Bristol Water	Bristol Water plc
CAA	Civil Aviation Authority
CAA Submission	CAA's reference to the CMA on the NERL RP3 price controls published on 25 November 2019
CAC40	French Large Cap index
CDG	Charles de Gaulle Airport
CMA	Competition and Markets Authority
CPI	Consumer price index
DAX	German Large Cap index
DfT	Department for Transport
EE	Europe Economics
Fraport	Fraport AG, who manage Frankfurt Airport
H7	Heathrow's upcoming price control
IBP	Initial Business Plan
NERL	NATS (En Route) plc
NERL Reference	The CAA's referral of its decision on the economic regulation of NATS (En Route) plc for RP3 period

	to the CMA dated 19 November 2019
NIC	National Infrastructure Commission
NIE	Northern Ireland Electricity Limited
NSL	NATS Services Limited
ONS	Office for National Statistics
RP3	The period 1 January 2020 until 31 December 2024
RPI	Retail price index
Stoxx Europe 600	European Large Cap index
TA 2000	Transport Act 2000
TMR	Total market return
UKRN	UK Regulators Network
WACC	Weighted average cost of capital
WIA 1991	Water Industry Act 1991