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Review of the CAA's proposed traffic risk sharing (TRS) mechanism

Final report

23 June 2022

Important Notice

Important Notice from Deloitte

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Background and purpose of this report

Background

- In 2014, the Civil Aviation Authority (CAA) determined that Heathrow Airport Limited (HAL) held market power and should be subject to economic regulation.
- The price control process for HAL is based on a single till regulatory regime whereby allowed regulated charges are determined on a per-passenger basis in order to deliver an estimated return (once commercial income is taken into account).
- In previous price controls, HAL has borne 100% of risk in relation to passenger traffic volumes in relation to these charges.
- However, the COVID-19 pandemic resulted in a significant reductions in passenger traffic, which was 73% and 76% lower in 2020 and 2021 respectively compared to 2019. [1]
- In April 2021, the CAA announced its decision to allow a £300m adjustment to HAL's regulatory asset base (RAB) in response to HAL's application for a COVID-19 related adjustment.[2]
- The CAA is currently in the final stages of developing the Final Proposals for HAL's upcoming price control H7 (which will determine funding between 2022 and 2026).
- In order to manage traffic risk in H7, the CAA have proposed introducing a traffic risk sharing (TRS) mechanism to share volume risk between HAL and airlines over the course of the control period.

Purpose

- The CAA has asked Deloitte to conduct an independent review of the TRS mechanism, specifically commenting on the calibration of the proposed parameters and assessing the relevance of the underlying evidence base. The CAA has asked Deloitte to focus on the numbers/parameters that they have arrived at. As such, Deloitte has not considered the process which the CAA has gone through and/or the logic it has applied in order to arrive at those numbers. To the extent that this document notes background information on the TRS mechanism (e.g. in respect of CAA's duties or objectives set out for the TRS mechanism) it does so solely to provide context to the reader.
- The parameters used for the TRS mechanism determine the traffic risk shared between HAL and the airlines depending on the variance of realised passenger numbers relative to the passenger forecast baseline.
- It is important to note that Deloitte's review of the TRS mechanism solely comprised a review of the matters set out as above. The review did not comprise any consideration of the political impact or acceptability of the TRS mechanism; consequently Deloitte has not commented on such matters in this document.
- The scope of Deloitte's work was to review the Initial Proposals for the TRS mechanism. Although this report may refer to updates in the CAA's thinking with respect to certain elements of the TRS mechanism since the publication of the Initial Proposals, Deloitte has not reviewed the CAA's updated position ahead of the publication of the Final Proposals.

[1] HAL (2022) Traffic statistics
[2] CAA (2021) Economic regulation of Heathrow Airport Limited: response to its request for a COVID-19 related RAB adjustment

Executive Summary (2/4)

Overview of the TRS mechanism and the CAA's review of evidence

Overview of the TRS mechanism and its objectives

- The main features of the TRS mechanism as defined in the Initial Proposals are as follows:
  - The TRS mechanism will use a banded approach to cumulative deviations between traffic forecasts and outturn;
  - The threshold for a greater level of risk sharing will be an cumulative deviation of actuals from forecast of more than 10%;
  - HAL will share with the airlines the present value of 40-60% of traffic risk for deviations of less than 10% (i.e. the 10% threshold);
  - HAL will share with the airlines the present value of 90-100% of risk for deviations greater than 10%;
  - HAL will recover through higher or lower future charges (depending on the direction of deviation) spread over a period of time; and
  - HAL will start recovering this value through charges in the following control period.
- In the Initial Proposals, the CAA states that the TRS mechanism was designed in order to:
  - "help to clarify the risks that HAL is expected to bear during the H7 price control period;
  - reduce the risk of significant gains or losses caused by passenger traffic variations over which HAL's management has limited control;
  - avoid unnecessary upward pressure on HAL's cost of capital; and
  - facilitate the certainty and stability of airport charges associated with a five-year price control."[1]

Review of evidence used by the CAA

- In developing and calibrating the mechanism, the CAA has focused on the following sources of evidence:
  - **Estimates of opex and commercial revenues** which the CAA have used to develop implied elasticities with respect to volume. These implied elasticities informed the proposed traffic risk sharing within the outer band which was calibrated to protect returns. The proposed 90-100% of traffic risk sharing within the outer band is estimated by CAA to reduce risk to HAL's EBITDA by 77-86%.[2]
  - **Precedent from other international airports** which have traffic risk sharing arrangements or tariff rebalancing conditions built into their price controls. This provided some support for the choice for a threshold of 10% for greater risk sharing.
  - **Historic deviations between passenger traffic forecasts and outturn** have been used to show that the 10% cumulative deviation threshold has never been breached in previous regulatory periods prior to COVID-19.

[1] CAA (2021) H7 Initial Proposals
[2] These estimates relate to those that were available to the CAA when developing the Initial Proposals.

Executive Summary (3/4)

Overview of key findings

1. Given the context of the COVID-19 pandemic and the impact that it has had on demand for air travel, it is clear that there is significant uncertainty around passenger volumes over the five year duration of the control period. Consequently, there is a **clear rationale for a risk-sharing mechanism to allow for airport charges to be adjusted to balance the exposure to volume risk for all industry parties from deviations in actual volumes from forecast volumes** (in line with other regulated and non-regulated airports).

2. In general, the review of supplementary evidence from other regulated sectors undertaken for this study has found limited precedent for risk sharing mechanisms as proposed by the CAA. This is arguably understandable given the unique circumstances arsing from COVID-19 and the particular cost/revenue structure of HAL.

3. The main supporting elements of regulatory precedent include:

    a. The approach of having **different percentages of risk sharing determined by a threshold is in line with precedent** in other international airports and regulated sectors in the UK (for example energy and rail operations).

    b. In particular, the current approach of **adopting a single threshold, above and below which the risk sharing percentages are varied, is in line with a number of relevant precedents** including other regulated airports in the EU, as well as, for example, Ofgem's approach to gas interconnectors. The proposal also has the benefit of simplicity compared to a more tiered system of risk sharing.

    c. Furthermore, **a volume deviation threshold of 10% proposed by CAA is broadly in line with precedent elsewhere**, such as other regulated airports in the EU and air traffic control in the UK. Review of historic deviations between forecast and outturn show that this threshold a cumulative deviation of 10% over the course of a control period has not been breached in previous control periods prior to the impact of COVID-19.

    d. The review of supplementary evidence has identified some precedent in other regulated sectors **for sharing volume risk up to 100%** such as the TRS mechanism for air traffic control in the UK, Ofgem's cap and floor regime for electricity interconnectors and Network Rail's track access charge regime where up to 100% of volume risk above a threshold is shared.

4. However at the same time, the limited precedent available, and the unique circumstances of HAL, do imply important challenges with using precedent to assess the CAA's proposals. Crucially, the limited precedent means there is no clear evidence for particular calibration parameters chosen by the CAA. In other words, the literature could support a potentially wide range of parameters, and so regulatory judgement and the process undertaken by the CAA in reaching that judgement will be critical to the calibration of the mechanism. Evaluating the approach taken by the CAA in this regard is beyond the scope of this report.

5. Finally, the work has also **identified some further points on the calibration of the mechanism that the CAA should consider as it refines the mechanism in the future**. These are summarised in the table overleaf and relate to the (i) market dynamics and impacts on passengers/airlines; (ii) the impact of outturn elasticities on outcomes; (iii) the proposal for 90-100% sharing of risk above the 10% threshold.

Executive Summary (4/4)

The CAA should consider a number of points as it continues to refine the TRS mechanism

The CAA has asked Deloitte to focus its review on the specific numbers/parameters which have been used to calibrate the mechanism for the Initial Proposals. With this in mind, the key areas that the CAA may wish to consider as it continues to refine the TRS mechanism as it moved towards publishing the Final Proposals are:

1. Impact of outturn elasticities on outcomes: The elasticities (of costs and commercial income with respect to volumes) used by the CAA to calibrate the mechanism (especially the 90-100% sharing proportion for deviations above 10%) are difficult to accurately estimate. It is therefore possible that the outcomes (e.g. in respect of HAL's revenue, EBITDA and airport charges) could be materially different to those currently forecast by the CAA (and potentially not as desired). This could result in HAL being over-compensated or under-compensated through the TRS, potentially significantly. The CAA may therefore wish to consider further testing the outcomes of its mechanism if the assumed elasticities used to calibrate the mechanism are incorrect and understand the extent to which errors in these elasticities could give rise to different financial outcomes (for HAL and airlines) to those intended by CAA. Besides any analysis, CAA should consider whether and how it would respond in future if the mechanism was to result in different outcomes to those that it had intended.

2. Proposal for 90-100% sharing of risk above the 10% threshold: Related to point 1., the rationale for the 90-100% parameter may not be obvious to all stakeholders. It relies on the assumed elasticities of costs and commercial income with respect to volume. As part of future publications, it is likely to be helpful for CAA to set out the reasoning behind why 90-100% revenue risk sharing.[1]

3. Market dynamics and impacts on passengers/airlines: The CAA has assessed the downstream market impacts by considering the possible effects of parameter choices on future regulated charges. However, it may wish to go further by exploring the market dynamics arising from different charging levels, and the potential impacts on airlines and passengers as a result. For example, understanding the extent to which increased airport charges will be passed through to passengers by airlines and the extent to which this will impact demand. Doing so could offer greater confidence around the calibration of the regime, and help uncover any potential risks around the regime.

[1] These estimates relate to those that were available to the CAA when developing the Initial Proposals.

Introduction

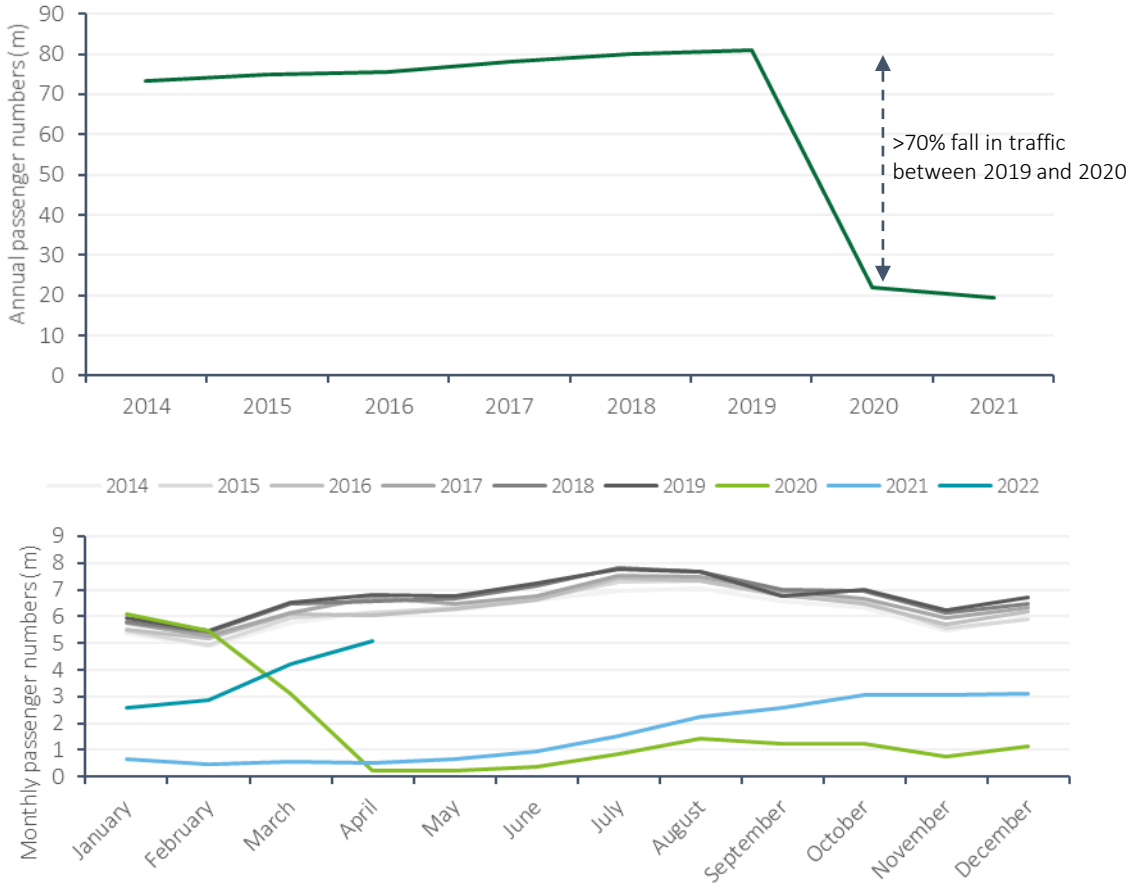
Introduction (1/3)

Context

Context

- The Civil Aviation Authority (CAA) is currently developing its final determination for Heathrow Airport Limited's (HAL's) next price control H7 (which will run from 2022 to 2026).
- In previous price controls, HAL's revenues from airport charges have been determined based on the passenger forecasts and HAL has borne 100% of the volume risk within control periods.
- The onset of the COVID-19 pandemic resulted in a significant fall in number of passengers travelling through Heathrow Airport, with passenger traffic 73% and 76% down in 2020 and 2021 respectively when compared to 2019. Monthly data from 2022 suggests that passenger traffic is recovering but it is still below the levels seen before the COVID-19 pandemic.[1]
- In April 2021, the CAA announced its decision to allow a £300m adjustment to HAL's regulatory asset base (RAB) in response to HAL's application for a COVID-19 related adjustment.[2]
- The CAA is now proposing to introduce a traffic risk sharing (TRS) mechanism in the Initial Proposals whereby HAL would share traffic risk with airlines.
- Since publishing its Initial Proposals, the CAA has continued to develop its thinking around the TRS mechanism and its calibration ahead of publication of the Final Proposals for H7.

Passenger traffic at Heathrow Airport between 2014 and 2021[1]



[1] HAL (2022) Traffic statistics
[2] CAA (2021) Economic regulation of Heathrow Airport Limited: response to its request for a COVID-19 related RAB adjustment

Introduction (2/3)

Purpose of this report

Purpose

- The TRS mechanism that the CAA has proposed contains various parameters that specify the extent of risk sharing at different levels of traffic deviations from baseline passenger traffic forecasts. The CAA has asked Deloitte to conduct an independent review of the TRS mechanism, specifically commenting on the calibration of the proposed parameters and assessing the relevance of the underlying evidence base. The CAA has asked Deloitte to focus on the numbers/parameters that they have arrived at. As such, Deloitte has not considered the process which the CAA has gone through and/or the logic it has applied in order to arrive at those numbers. To the extent that this document notes background information on the TRS mechanism (e.g. in respect of CAA's duties or objectives set out for the TRS mechanism) it does so solely to provide context to the reader.
- In conducting this review, Deloitte has considered the evidence which the CAA used when developing its the Initial Proposals as well as supplementary evidence which Deloitte has identified which has included precedents from other regulated sectors and public companies as well as other relevant research.
- This report sets out an overview of the TRS mechanism itself and its characteristics, the evidence which the CAA has used to develop the Initial Proposals and the findings of Deloitte's review of this evidence as well as supplementary research which has been conducted.
- The scope of this work did not include:
  - Consideration of other potential risk sharing mechanisms or the appropriateness of the mechanism itself, nor whether risk sharing in general between HAL and airlines is appropriate or otherwise. The report does not comment on whether outcomes that the mechanism is likely to lead to are at the desirable level.
  - A remit to engage with the airlines or other third parties to understand their perspectives on the risk sharing mechanism.
  - Consideration for the interaction between the TRS mechanism and HAL's cost of capital.
  - Consideration for any political issues relating to the TRS mechanism.
- Deloitte has not verified any information which has been provided by the CAA as part of this work.
- The scope of Deloitte's work was to review the Initial Proposals for the TRS mechanism. Although this report may refer to updates in the CAA's thinking with respect to certain elements of the TRS mechanism since the publication of the Initial Proposals, Deloitte has not reviewed the CAA's updated position ahead of the publication of the Final Proposals.
- The CAA have also asked Deloitte to consider some specific comments which have been made by British Airways in response to the Initial Proposals and the calibration of the TRS mechanism.

Introduction (3/3)

Structure of this report

Structure of this report

This report is structured into three sections as follows:

- Section 1 provides an overview of the TRS mechanism, HAL's regulatory regime, the objectives for the proposed risk sharing mechanism and how it relates to CAA's statutory duties.
- Section 2 reviews the evidence considered by the CAA to calibrate the mechanism for the Initial Proposals and evidence which has been shared with the CAA since the publication of those proposals.
- Section 3 covers the key findings of the report such as the calibration of the mechanism, the CTA elasticities, thresholds and risk bands and overall objectives.

Overview of the TRS mechanism

Overview of the TRS mechanism (1/5)

Overview of the section

- This section provides an overview of the TRS mechanism proposed by the CAA.
- The purpose of the section is to present the design of the TRS mechanism and what objectives it is trying to fulfil.
- The section sets out:
  - The role of the CAA with respect to the economic regulation of HAL;
  - HAL's regulatory regime;
  - Key uncertainties in setting airport charges in H7 and objectives for the TRS mechanism; and
  - The design of the proposed TRS mechanism.

Overview of the TRS mechanism (2/5)

Role of the CAA with respect to the economic regulation of HAL

Role of the CAA

- The CAA is the regulator of civilian air travel in the UK and is responsible for the economic regulation of airports deemed to have market power.
- The CAA's general duty with respect to the economic regulation of airports deemed to have market power is defined in the Civil Aviation Act 2012.

1. *The CAA must carry out its functions under this section in a manner which it considers will further the interests of users of air transport services regarding the range, availability, continuity, cost and quality of airport operation services.*
2. *The CAA must do so, where appropriate, by carrying out the functions in a manner which it considers will promote competition in the provision of airport operation services.*[1]

- The duty outlines that the CAA must carry out its functions in the interests of users of air transport services (passengers and freight).
- In performing its duties, the CAA must have regard for the ability for airports to finance the provision of airport operation services and to secure that all reasonable demands for airport operation services are met. [1,2]
- The CAA is also required to have regard for the following principles:

a) *regulatory activities should be carried out in a way which is transparent, accountable, proportionate and consistent, and*

b) *regulatory activities should be targeted only at cases in which action is needed.*[1,2]

[1] legislation.gov.uk (2020) Civil Aviation Act 2012
[2] These are a subset of the secondary duties which the CAA must have regard for.

Overview of the TRS mechanism (3/5)

HAL's regulatory regime

HAL's regulatory regime

- Heathrow Airport is one of a number of airports across London and the UK. It provides baggage, security and other services to the airlines which use Heathrow.
- In 2014, the CAA determined that Heathrow Airport met the CAA's three tests for market power citing the following evidence.[1]

1. *The most likely source of any SMP that HAL has stems from its position as the operator of the UK's only hub airport and the combined package that Heathrow offers of strong demand, including premium passengers, cargo and connecting passengers. This makes Heathrow attractive for both based and inbound airlines.*
2. *The airline network effects available at Heathrow means that very few airlines would be able and willing to switch sufficient capacity to constrain an increase in HAL's charges.*
3. *Heathrow's good surface access options, the inherent attractiveness of the London market, and its strategic importance to airlines combined with the capacity constraints in the London system act to reduce the available alternatives to airlines.*
4. *The strength of airline demand to operate from Heathrow means that HAL would be effectively insulated from the effects of any switching away as a result of higher airport charges.*

- Since this market power determination, The CAA has granted HAL a licence which has included a price control on airport charges.[2]
- The CAA have proposed to set regulated airport charges based on the following:[3]

1. *a "single till" covering commercial and regulated revenues;*
2. *a RAB and allowed return/cost of capital; and*
3. *assumptions about passenger numbers, operating and capital costs and commercial revenues*

- Airport charges are determined by estimating the value of HAL's allowable opex costs, recovery and return of its RAB less the forecast commercial revenues. The remaining value is divided by the forecast number of passengers to develop a per passenger charge.[4]
- The passenger traffic forecasts are an important input to the calculation of airport charges as to some extent they drive forecasts of opex as well as commercial revenues as well as forming the denominator in the calculation of per passenger charges. In the first instance, HAL will develop its forecasts of passenger traffic. The CAA determine what forecasts will be used as the basis for setting airport charges in the Final Proposals. Airlines will have he opportunity to comment on both sets of forecasts through the consultation process.
- Setting these forecasts in previous control periods may have been helped by HAL operating closer to its operational capacity before COVID-19.

[1] CAA (2014) Market power determination in relation to Heathrow Airport – statement of reasons
[2] CAA (2021) Economic licencing of Heathrow Airport
[3] CAA (2021) H7 Initial Proposals
[4] HAL's Regulatory Asset Base (RAB) is designed to represent a store of value to be recovered over time through regulated charges.

Overview of the TRS mechanism (4/5)

Key risks in setting airport charges and objectives for the TRS mechanism

Addressing passenger volume uncertainty

- Given the passenger forecasts are an integral input to the H7 price control and determining airport charges, it is worth considering potential sources of forecasting error which could lead to the charges set incorrectly. These include, for example:
  - Natural, exogenous events which are beyond the control of the CAA or HAL (for example, the impact of COVID-19);
  - Changes in consumer behaviours which could impact demand (for example changes to the relationships between demand for air travel and price or income); and
  - Changes to the nature of competition or market dynamics in the aviation sector.
- In the Initial Proposals, the CAA sets out the following challenges:

This price control review is being conducted in particularly challenging circumstances:

- *HAL, and the aviation sector more widely, are recovering from the extremely severe impact of the covid-19 pandemic, and the associated travel restrictions, on passenger numbers;*
- *significant uncertainty remains about the future path of this recovery;*[1]

- As a result of these uncertainties, the CAA proposed to incorporate a traffic risk sharing mechanism such that the impact of deviations from traffic forecasts were not wholly borne by HAL in the Initial Proposals for H7.

The CAA's stated objectives for the TRS mechanism

In its H7 Initial Proposals, CAA's stated the following objectives for the TRS mechanism. These focus primarily on HAL and the impact to charges over time.

We consider that the approach to calibrating and reconciling TRS arrangements set out above will:

- *help to clarify the risks that HAL is expected to bear during the H7 price control period;*
- *reduce the risk of significant gains or losses caused by passenger traffic variations over which HAL's management has limited control;*
- *avoid unnecessary upward pressure on HAL's cost of capital; and*
- *facilitate the certainty and stability of airport charges associated with a five-year price control.*[1]

[1] CAA (2021) H7 Initial Proposals

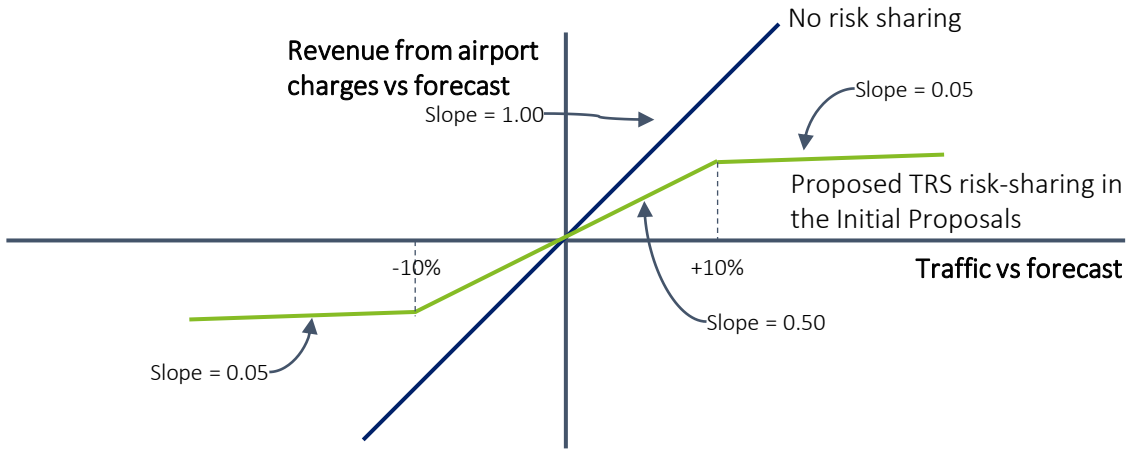
Overview of the TRS mechanism (5/5)

The design of the proposed TRS mechanism

Initial proposed design of the TRS mechanism consulted upon by CAA

- In previous control periods, if the traffic outturn (realised passenger demand) was higher or lower than the previously forecast levels then HAL was exposed to 100% of the value of those deviations.
- In the Initial Proposals, the CAA proposed to incorporate a traffic risk sharing mechanism such that the impact of deviations from traffic forecasts were not wholly borne by HAL.
- The CAA proposed to design a mechanism with the following features:
  - A banded approach to cumulative deviations between traffic forecasts and outturn over the course of the control period;
  - The mechanism will be symmetric, treating deviations higher and lower than forecast the same; [1]
  - The threshold for a greater level of risk sharing will be a cumulative deviation of actuals from forecast of more than 10%;
  - HAL will recover or share with the airlines the present value of 40-60% of traffic risk for deviations of less than 10% (i.e. the 10% threshold);
  - HAL will recover or share with the airlines the present value of 90-100% of risk for deviations greater than 10%;
  - The value of these deviations (either positive or negative) would be added to HAL's RAB which would be updated annually;
  - HAL will recover through higher or lower future charges (depending on the direction of deviation) spread over a period of time; and
  - HAL will start recovering this value through charges in the following control period.

Diagram illustrating the impact of the TRS mechanism on revenues for different levels of deviation in passenger traffic volumes[2]



[1] The CAA recognises that the risks faced by HAL are often asymmetric (as before the COVID-19 pandemic Heathrow Airport often operated at capacity. Asymmetric risk is therefore accounted for through two additional mechanisms. The first is the application of a shock factor which was part of the current price control and an additional revenue allowance for pandemic level shocks. These mechanisms are not considered within the scope of this review.
[2] The value of risk sharing has assumed to be the mid-point of the ranges set out on this page.

Evidence used to calibrate the TRS mechanism

Evidence used to calibrate the TRS mechanism (1/5)

Overview of the section

- This section sets out the evidence that the CAA has used to calibrate the TRS mechanism as proposed.
- The purpose of the section is to outline that evidence rather than to present any of Deloitte's judgements or findings in relation to it.
- The evidence used by the CAA and which is summarised in this section of the report is as follows:
  - Passenger forecasts for H7;
  - Bottom-up opex and commercial revenue forecasts from CEPA and Taylor Airey;
  - Historic deviations between passenger traffic and outturn; and
  - Precedent from other international airports.

Evidence used to calibrate the TRS mechanism (2/5)

Passenger traffic forecasts for H7

Passenger traffic forecasts for H7

- The CAA has been developing its passenger traffic forecasts for H7 and has developed three passenger growth scenarios (low, mid and high) over the course of the control period. These forecasts will not be finalised until the CAA publishes the Final Proposals for H7.
- The CAA's mid passenger growth forecast is used as the basis for setting airport charges as well as the TRS mechanism. When calculating the value of the TRS mechanism to HAL in any given year, the passenger outturn figures would therefore be compared to this forecast.
- These passenger forecasts have also been the basis of further analysis which has been used to calibrate the TRS mechanism (in particular the opex and commercial revenue forecasts).
- In all scenarios, the CAA does not forecast passenger traffic to recover until at least 2024 – mid-way through the control period – and in the CAA's low passenger growth scenario it is not expected to recover until the next control period.
- The historic forecasts also demonstrate the asymmetric nature of risk that is faced by HAL generally. Although we note that the TRS mechanism itself is symmetric in how it deals with risk, the CAA has other adjustments for asymmetric risk within other elements of the price control.

Historic and forecast passenger traffic between 2014-2026[1,2,3]

[1] HAL (2022) Traffic statistics
[2] CAA
[3] These forecasts relate to those that were available to the CAA when developing the Initial Proposals.

Evidence used to calibrate the TRS mechanism (3/5)

Cost and commercial revenue elasticities with respect to passenger volume

Estimating elasticities for opex and commercial revenues

- The CAA commissioned CEPA and Taylor Airey to review HAL's forecasts of opex and commercial revenues for H7.
- CEPA and Taylor Airey employed a bottom-up approach to develop their own estimates of HAL's opex and commercial revenues in three scenarios: high, mid and low passenger growth traffic forecasts provided by the CAA (see previous page).
- From these forecasts, the CAA calculated implied elasticities for both opex and commercial revenues. It did this by comparing the change in opex or commercial revenues to the change in the passenger traffic forecast in each year. Using the high and low scenarios, the CAA estimated elasticities for both positive and negative changes to passenger traffic. An average (weighted by the base passenger forecast) was then calculated to arrive at average elasticities.
- These elasticities have in turn been used to calculate the extent to which HAL's EBITDA is protected using different levels of risk sharing in the TRS mechanism. From this analysis, the CAA suggested in its Initial Proposals to share 90-100% of regulated revenue risk in the higher band. This would provide 77-86% of protection to HAL's EBITDA.[2]

Forecast passenger traffic, opex and commercial revenues for H7[1]

Passenger traffic forecasts (m)	2022	2023	2024	2025	2026
Base case (CAA Mid passenger growth)	45.6	60.2	72.0	79.4	82.0
CAA High passenger growth	54.2	69.4	80.1	86.2	88.3
% deviation from base case	18.8%	15.2%	11.3%	8.6%	7.7%
CAA Low passenger growth	18.7	36.3	55.2	63.5	70.9
% deviation from base case	-59.0%	-39.8%	-23.4%	-20.0%	-13.6%

Opex (£m)	2022	2023	2024	2025	2026
Base case (CAA Mid passenger growth)	909.0	966.0	1,000.0	1,006.0	995.0
CAA High passenger growth	946.0	1,005.0	1,033.0	1,033.0	1,019.0
% deviation from base case	4.1%	4.0%	3.3%	2.7%	2.4%
CAA Low passenger growth	791.0	849.0	904.0	932.0	952.0
% deviation from base case	-13.0%	-12.1%	-9.6%	-7.4%	-4.3%

Commercial revenues (£m)	2022	2023	2024	2025	2026
Base case (CAA Mid passenger growth)	694.0	823.0	908.0	993.0	1,018.0
CAA High passenger growth	774.0	910.0	979.0	1,052.0	1,072.0
% deviation from base case	11.5%	10.6%	7.8%	5.9%	5.3%
CAA Low passenger growth	449.0	598.0	755.0	848.0	919.0
% deviation from base case	-35.3%	-27.3%	-16.9%	-14.6%	-9.7%

[1] CAA

[2] These estimates and forecasts relate to those that were available to the CAA when developing the Initial Proposals.

Evidence used to calibrate the TRS mechanism (4/5)

Historic traffic forecasts

Historic traffic forecasts

- The CAA also considered the historic deviations between traffic forecasts and outturn in previous control periods to help determine what threshold should be used to enter higher risk sharing.
- This is one part of evidence which was used to determine the 10% threshold.
- As can be seen in the chart to the right, the cumulative difference of 10% has not been breached in previous control periods prior to the impact of COVID-19.

Cumulative deviations between passenger traffic forecasts and outturn (%)[1]

[1] CAA

Evidence used to calibrate the TRS mechanism (5/5)

Precedent from other regulated international airports

Risk sharing arrangements from other international airports

- In designing the TRS mechanism, CAA considered similar risk sharing arrangements for other international airports.
- Although there was no evidence of mechanisms which were exactly the same, there were some similar mechanisms where multi-year price controls were in place.
- The evidence which CAA has considered is summarised in the table on the right. It provides some evidence of traffic risk sharing mechanisms utilised in other regulated airports in Europe as well as evidence of 10% being used as a threshold for either these mechanisms or for a rebalancing of tariffs.

Summary of evidence from other regulated airports or air traffic control shared by CAA[1]

Airport / Air traffic control	Description
Airports	
Airports de Paris (France)	ADP has an annual price control which in principle mitigates traffic risks through annual recalculation of the price cap. A traffic risk sharing mechanism was previously in place at ADP when operating in a multi-year price control.
AENA (Spain)	Price control covers all of AENA's airports and it bears all traffic risk except in exceptional circumstances defined as a change of 10% from the previous year.
Aeroporti di Roma (Italy)	ADR bears all traffic risk within 5% of forecast and 50% of risk beyond this. There is also an allowance for a tariff rebalancing for annual changes greater than 6%.
Budapest Airport (Hungary)	Budapest Airport has a traffic risk sharing mechanism for annual deviations less than 10% of forecast levels and can apply for a revision in the price cap following deviations greater than this.
Air traffic control	
NATS (UK)	NATS shares 70% of risk for traffic deviations between 2% and 10% of forecast levels and 100% of risk for deviations greater than that.

[1] This reflects the situation when the CAA carried out its original research for the Initial Proposals but the frameworks for some of these airports has changed since that research.

Key findings

Key findings (1/4)

The overall rationale for developing a risk sharing mechanism in the UK is clear

Rationale for a risk sharing mechanism

- Given the context of the COVID-19 pandemic and the impact that it has had on demand for air travel, it is clear that there is significant uncertainty around passenger volumes over the five year duration of the control period. The impact of this uncertainty is evident from the scale of passenger growth forecast within the CAA's passenger growth scenarios (see Page 21).
- Consequently, there is a **clear rationale for a risk-sharing mechanism to allow for airport charges to be adjusted to protect all industry parties from deviations in actual volumes from forecast.**
- Sharing volume risk between different parties is a common characteristic of regulatory regimes both across other international airports and regulated sectors in the UK. For example:
  - Other international airports have charge rebalancing conditions included in their regulatory settlement (e.g. AENA, Aeroporti di Roma and Budapest Airport).
  - Air traffic control in the UK (NERL) operates under a similar traffic risk sharing mechanism that has been proposed by CAA for HAL.
  - Network Rail effectively shares 100% of volume risk through the design of its track access regime which recovers fixed and variable costs separately.

Key findings (2/4)

Relevant precedent is limited, but what is available is not inconsistent with the approach that has been taken by the CAA

Relevant precedent

- In general, the review of supplementary evidence from other regulated sectors undertaken for this study has found limited precedent for risk sharing mechanisms as proposed by the CAA. This is arguably understandable given the unique circumstances arsing from COVID-19 and the particular cost/revenue structure of HAL.
- The main supporting elements of regulatory precedent include:
  - The approach of having **different percentages of risk sharing determined by a threshold is in line with precedent** in other international airports (see examples 2 on the table to the right) and regulated sectors in the UK for example energy and rail (6 and 7).
  - In particular, the current approach of **adopting a single threshold, above and below which the risk sharing percentages are varied, is in line with a number of relevant precedents** including other regulated airports in the EU (2) as well as, for example Ofgem's approach to electricity interconnectors (7). The proposal also has the benefit of simplicity compared to a more tiered system of risk sharing.

Examples from other sectors[3]		Design of risk sharing mechanism*
Airports		
(1)	AENA	Price control covers all of AENA's airports and it bears all traffic risk except in exceptional circumstances defined as a change of 10% from the previous year.
(2)	Aeroporti di Roma	ADR bears all traffic risk within 5% of forecast and 50% of risk beyond this. There is also an allowance for a tariff rebalancing for annual changes greater than 6%.
(3)	Budapest Airport	Budapest Airport has a traffic risk sharing mechanism for annual deviations less than 10% of forecast levels and can apply for a revision in the price cap following deviations greater than this.
Air traffic control and other regulated sectors		
(4)	NATS	NATS shares 70% of risk for traffic deviations between 2% and 10% of forecast levels and 100% of risk for deviations greater than that.
(5)	Crossrail Central Operating Section (CCOS)	Track access charges for using CCOS are updated in the event of a material change which is defined as an increase or decrease of 10% or more of timetabled train movements on CCOS.[1]
(6)	Electricity interconnectors	Ofgem operates a cap and floor regime for electricity interconnectors which allows for volume risk whilst guaranteeing a certain level of return once volume has reached the cap or floor.[2]
(7)	Train operating companies	The Forecast Revenue Mechanism in place for certain rail franchises was a means for sharing revenue risk between the Department and the Train Operating Companies. It involved a dead band of typically 3% to 4% beyond which a proportion of revenue risk was shared.
(8)	Network Rail	Network Rail's access charge regime is designed to include fixed and variable track access charges and therefore effectively shares 100% of volume risk by recovering its fixed and variable costs separately.

*Please note that some of the information included in this table is repeated from (Page 24).

[1] TfL (2020) Crossrail Central Operating Section Network Statement
[2] Ofgem (2016) Cap and floor regime: unlocking investment in electricity interconnectors
[3] This reflects the situation when the CAA carried out its original research for the Initial Proposals but the frameworks for some of these airports has changed since that research.

Key findings (3/4)

Relevant precedent is limited, but what is available is not inconsistent with the approach that has been taken by the CAA (cont.)

- Furthermore, **a volume deviation threshold of 10% proposed by CAA is broadly in line with precedent elsewhere**, such as other regulated airports in the EU (1, 3), air traffic control in the UK (4) and other regulated sectors (5). Review of historic deviations between forecast and outturn show that this threshold would not have been breached in previous control periods prior to the impact of COVID-19.
- Finally, the review of supplementary evidence has identified a number of examples of **volume risk sharing up to 100%.** For example, the TRS mechanism for NATS (4), Ofgem's cap and floor regime for electricity interconnectors (6) and Network Rail's track access charge regime (8).

- However at the same time, the limited precedent available, and the unique circumstances of HAL, do imply important challenges with using precedent to assess the CAA's proposals. Crucially, the limited precedent means there is no clear evidence for particular calibration parameters chosen by the CAA. In other words, the literature could support a potentially wide range of parameters, and so regulatory judgement and the process undertaken by the CAA in reaching that judgement will be critical to the calibration of the mechanism. Evaluating the approach taken by the CAA in this regard is beyond the scope of this report.

Examples from other sectors[2]		Design of risk sharing mechanism*
Airports		
(1)	AENA	Price control covers all of AENA's airports and it bears all traffic risk except in exceptional circumstances defined as a change of 10% from the previous year.
(2)	Aeroporti di Roma	ADR bears all traffic risk within 5% of forecast and 50% of risk beyond this. There is also an allowance for a tariff rebalancing for annual changes greater than 6%.
(3)	Budapest Airport	Budapest Airport has a traffic risk sharing mechanism for annual deviations less than 10% of forecast levels and can apply for a revision in the price cap following deviations greater than this.
Air traffic control and other regulated sectors		
(4)	NATS	NATS shares 70% of risk for traffic deviations between 2% and 10% of forecast levels and 100% of risk for deviations greater than that.
(5)	Crossrail Central Operating Section (CCOS)	Track access charges for using CCOS are updated in the event of a material change which is defined as an increase or decrease of 10% or more of timetabled train movements on CCOS.[1]
(6)	Electricity interconnectors	Ofgem operates a cap and floor regime for electricity interconnectors which allows for volume risk whilst guaranteeing a certain level of return once volume has reached the cap or floor.[2]
(7)	Train operating companies	The Forecast Revenue Mechanism in place for certain rail franchises was a means for sharing revenue risk between the Department and the Train Operating Companies. It involved a dead band of typically 3% to 4% beyond which a proportion of revenue risk was shared.
(8)	Network Rail	Network Rail's access charge regime is designed to include fixed and variable track access charges and therefore effectively shares 100% of volume risk by recovering its fixed and variable costs separately.

*Please note that some of the information included in this table is repeated from (Page 24).

[1] CAA (2021) H7 Initial Proposals
[2] This reflects the situation when the CAA carried out its original research for the Initial Proposals but the frameworks for some of these airports has changed since that research.

Key findings (4/4)

The CAA should consider a number of points as it continues to refine the TRS mechanism

The CAA has asked Deloitte to focus its review on the specific numbers/parameters which have been used to calibrate the mechanism. With this in mind, the key areas that the CAA may wish to consider as it continues to refine the TRS mechanism as it moved towards publishing the Final Proposals are:

1. Impact of outturn elasticities on outcomes: The elasticities (of costs and commercial income with respect to volumes) used by the CAA to calibrate the mechanism (especially the 90-100% sharing proportion for deviations above 10%) are difficult to accurately estimate. It is therefore possible that the outcomes (e.g. in respect of HAL's revenue, EBITDA and airport charges) could be materially different to those currently forecast by the CAA (and potentially not as desired). This could result in HAL being over-compensated or under-compensated through the TRS, potentially significantly. The CAA may therefore wish to consider further testing the outcomes of its mechanism if the assumed elasticities used to calibrate the mechanism are incorrect and understand the extent to which errors in these elasticities could give rise to different financial outcomes (for HAL and airlines) to those intended by CAA. Besides any analysis, CAA should consider whether and how it would respond in future if the mechanism was to result in different outcomes to those that it had intended.

2. Proposal for 90-100% sharing of risk above the 10% threshold: Related to points 1. and 2., the rationale for the 90-100% parameter relies on the assumed elasticities of costs and commercial income with respect to volume. Deloitte understand that the CAA is considering increasing the level risk sharing to be above 100%. The logic of this will be nuanced and may not to be obvious to all stakeholders. As part of future publications, it is likely to be helpful for CAA to set out the reasoning behind why the level of traffic risk sharing and associated EBITDA exposure has been judged appropriate.

3. Market dynamics and impacts on passengers/airlines: The CAA has assessed the downstream market impacts by considering the possible effects of parameter choices on future regulated charges. However, it may wish to go further by exploring the market dynamics arising from different charging levels, and the potential impacts on airlines and passengers as a result. For example, understanding the extent to which increased airport charges will be passed through to passengers by airlines and the extent to which this will impact demand. Doing so could offer greater confidence around the calibration of the regime, and help uncover any potential risks around the regime.

Appendix A

Specific issues in relation to the TRS mechanism

Specific issues relating to the TRS mechanism (1/2)

Correction (K) Factor, other pass through costs and other regulatory charges

The CAA has asked Deloitte to consider the position of a few particular issues which have arisen from the stakeholder consultation and in particular comments from British Airways. The CAA has asked Deloitte to consider these and the appropriateness of the CAA's position. The specific adjustments, British Airway's comments, the CAA's response and Deloitte's comments are set out in these pages.

Adjustment	Adjustments
Description	**Correction factor –** The correction factor adjusts for over- or under-recovery of costs on a per passenger basis compared to the maximum allowable yield. These deviations generally reflet a change in the mix of actual passengers and movements compared to the forecasts that are used to set the airport charges for the relevant year. [2] **Other pass through costs –** These relate to other costs which Heathrow is allowed to recover through its airport charges and include business rates and security costs. These adjustments are shown in the maximum revenue yield per passenger formula. **Other regulatory charges –** Other regulated charges (ORCs) are charges for specified services and facilities that are collected separately to the regulated airport charges and are in general levied on a 'user-pays' basis. In previous control periods this has included fixed costs including annuities and allocated costs but it is proposed in H7 that these move to the regulated airport charges and the ORCs are collected on a marginal, per passenger basis. [2]
BA's query[1]	"3.59. Nevertheless, we are unclear why the CAA has proposed that such calculations are performed "excluding the correction factor"; it would be an error to exclude these factors from TRS without specifying the rationale for doing so, and this is particularly important to consider where the correction factor serves to compensate consumers for over-collection against average revenue per passenger in previous years 3.60. Excluding the correction factor could therefore have the effect of causing consumers to over compensate Heathrow if passengers are below forecast, as they would not have been recompensed the correction factors (k-factor, cumulative capex adjustment or other pass-through costs) in full against the out-turn passenger numbers as compared to the value of those adjustments when they were set, with the converse occurring if passenger numbers rise above forecast 3.67. As described, the CAA's proposal does not appear to be consistent with its earlier narrative, and where it states that it proposes for the "cumulative impact of differences between forecast and outturn traffic levels will then be calculated as the difference between cumulative allowed revenues calculated using outturn traffic levels and forecast traffic levels", we believe this is in error since exclusions related to ORCs and other pass-through costs have not been specified"
CAA's rationale	• The CAA have not included these adjustments or charges in the calculation of the TRS mechanism. • Overall, this is because these adjustments are applied on a per passenger basis on the passenger outturn in reality and is therefore not impacted by the variations between passenger outturn an forecasts. • Therefore, to ensure internal consistency with the rest of the regulatory regime, and avoid any over- or under-compensation, these adjustments are not included in the TRS mechanism.
Deloitte comments	As these adjustments are all applied on a per passenger basis, and provided that these are applied once the passenger outturn is known, then the CAA's position is reasonable.

[1] British Airways (2021) British Airways Response to CAP2265 Economic regulation of Heathrow Airport Ltd H7 Initial Proposals
[2] HAL (2022) Airport Charges for 2022: Consultation Document

Specific issues relating to the TRS mechanism (2/2)

Shock Factor

The CAA has asked Deloitte to consider the position of a few particular issues which have arisen from the stakeholder consultation and in particular comments from British Airways. The CAA has asked Deloitte to consider these and the appropriateness of the CAA's position. The specific adjustments, British Airway's comments, the CAA's response and Deloitte's comments are set out in these pages.

Adjustment	Shock Factor
Description	In calibrating its passenger forecasts, the CAA applies an annual "shock factor" of -1.07% in order to reflect the fact that historically there have been downward shocks such as the Gulf War, 9/11 terrorism attacks, SARS and volcanic ash. This adjustment is applied to provide a more accurate expected value of passenger volumes as the CAA's forecast model doesn't account for this type of shock.
BA's query[1]	"3.73. Including a shock factor artificially reduces the baseline passenger numbers, which transfer the risk of such shocks to consumers before risk sharing takes place; the application of risk sharing on top of this adjustment further transfer risk to consumers, and the CAA must remove this shock factor in order to accurately calibrate the TRS."
CAA's rationale	• The purpose of applying the shock factor to the passenger forecasts is so that the forecast more accurately reflects the expected number of passengers rather than a mechanism to compensate HAL for asymmetric risk i.e. it is intended to ensure that the forecasts better reflect the **expected value** of traffic. • The CAA has stressed that the purpose of this is not to compensate for and/or provide protection against traffic risk. • It is therefore appropriate to use the adjusted forecasts for estimating airport charges and also as the baseline for the TRS mechanism.
Deloitte comments	Provided that the explanations and rationale that the CAA has provided Deloitte (i.e. that the shock factor is used to improve the accuracy of the forecasts, rather than provide compensation for risk), it would appear reasonable for the TRS mechanism's baseline to be based on the passenger forecasts after they have been adjusted by the shock factor.

[1] British Airways (2021) British Airways Response to CAP2265 Economic regulation of Heathrow Airport Ltd H7 Initial Proposals
[2] HAL (2022) Airport Charges for 2022: Consultation Document
[3] CAA (2020) Heathrow Airport Limited Licence granted under the Civil Aviation Act 2012. Shared by CAA via email 17 May 2022.

Deloitte.