



CAA H7 Forecast Review

Final Report

Document October 2021

Document Sharing Hub



Scope of the Report and Limitation of Liability

Introduction

This report contains the results of Skylark Consulting Group Limited ("Skylark") advisory services for the purpose of supporting the evaluation of the CAA's H7 passenger forecast assumptions and approach (the "Work"). It has been prepared for the CAA (the "Client"), in accordance with the engagement letter and for no other purpose.

The contents of this report are private and confidential. It is for the Client's exclusive use and is not to be relied on by or made available to any other party without Skylark's prior written consent.

Scope of Work and Liability

The scope of work for this assignment is set out in the proposal. For the avoidance of doubt, Skylark's liability to the Client for any loss arising out of or in connection with this report is subject to all exclusions and limitations of liability set out in the engagement letter. Skylark does not accept a duty of care to any person other than the Client in respect of this report.

Terms of Work

Skylark's Work including this report are made subject to the following qualifications:

- Skylark only accepts liability for material in this report if it is clearly marked as "Final" and is not marked as "Draft";
- This Work does not replace the representations or warranties to be made by any third party;

- Where Skylark's Work includes projections, estimates or any forward looking statements, those will be based on a number of assumptions not all of which may be explicitly stated and which will vary to a greater or lesser extent from actual circumstances in the future, and as such the projections, estimates and forward looking statements may not turn out to be accurate and may not be realised or achieved in part or at all; in fact it is almost certain that actual events will differ from expectations to a greater or lesser extent;
- Skylark's Work is based solely on the information provided by the Client or its other advisers in connection with this Work and publicly available information; in particular, Skylark has not included or considered in the Work or this report any information provided as part of any other project or transaction or which is subject to obligations of confidentiality to a third party;
- That the information used may not comprise all information that ought to have been supplied to Skylark for the purpose of the Work and may not contain all the information relevant to the Client's decisions related to the Work;
- The information in this report does not constitute legal, tax, accountancy, insurance, property valuation or regulatory advice; and,
- Where this report covers information from documents containing confidentiality undertakings with third parties, breach of those undertakings may entitle the third parties to terminate the relevant agreement and/or claim damages for breach.

Skylark Consulting Group Limited
September 2021

Contents

Executive Summary	4
1. Introduction and Approach	7
2. Market Share	10
3. Airline Trends	13
4. Airline Fares	18
5. Forecasting Techniques	21
Appendix	29



Executive Summary

Executive Summary

This report responds to the request from the CAA to provide a high level and independent review of their response to the traffic forecasts provided by Heathrow Airport Limited (HAL) in support of the 7th quinquennial regulatory review (H7), as per the scope of work described in the Appendix.

Skylark concludes that the approach and specific challenges developed by the CAA are reasonable and proportionate. In some areas Skylark believes that the CAA should challenge further and in others that the Heathrow assumptions are reasonable but require further clarification or supporting evidence.

Market Share

The CAA disagrees with HAL's assumption and forecast output that LHR's market share will not return to 2019 levels during H7. Skylark regards the CAA assumptions as reasonable, owing to market shocks historically forcing concentration at LHR.

Airline Trends

HAL argues that the impact of the pandemic will reduce widebody activities at LHR and that airlines will also be limited in the speed at which they can provide additional capacity to meet recovery in demand. The CAA disagrees with both of these assumptions and has made upwards adjustments to the forecast of 7.3 million passengers as a result. Skylark views the CAA assumptions as reasonable; although HAL's B747 retirement assumptions are reasonable, Skylark is more optimistic surrounding the use of A380 aircraft. Skylark also believe that airlines present at LHR will provide additional capacity as soon as demand increases or that any spare capacity will be filled by new entrants, given the attractiveness of capacity at LHR.

Airline Fares

HAL have included airline fares as an input to their forecast model. There is no industry consensus on approaches to quantitative forecasting analysis using airline fares; some commentators and organisations utilise airline fares as an input, while others believe that airline fares are better viewed as an output. The CAA accepts the use of assumed impact of carbon prices on fares but have removed the impact on fares as a result of the proposed reduction in business travel. The CAA believes that in the case of LHR, business fares will adjust according to the market. Skylark believes that the CAA's assumption is reasonable, as LHR is a congested airport and operates within a competitive multi-airport system. Ticket prices are likely market driven and difficult to forecast accurately over the regulatory period.

Slot Allocation Impact

Skylark believes that HAL's assumption that slots will go un-utilised over the regulatory period is overly pessimistic. Skylark believes that airlines will either reallocate capacity to profitable routes or partner airlines or sell slots to new entrants. Skylark recommends that the CAA request additional scenarios in this regard to be modelled.

Economic Forecast Scenarios

Skylark supports the underlying importance of GDP forecasts as a fundamental driver of HAL's traffic growth, and the combination of regression analysis utilising those econometric drivers for a globally important hub airport such as Heathrow would represent industry best practice. Skylark believes the CAA are correct in maintaining HAL's methodology of matching GDP and traffic scenarios given the variance in recovery outlooks.

Executive Summary

Skylark's recommendation is for the CAA to continue with their current approach, but request for HAL to provide the most up-to-date GDP forecasts, given the speed at which Covid-19 recovery outlooks change.

Business Traffic

HAL models a 10%-30% permanent reduction of business travel customers based on individual market share thresholds which has been accepted by the CAA as part of the H7 assumption base. Skylark believes there is little empirical evidence to support a permanent shift in business behaviour based on the supporting evidence provided, and would consider forecasts underpinned by GDP growth to be a more appropriate mechanism to capture any potential changes in business activity.

Decay Function

Skylark concurs with HAL and the CAA with the principle of introducing an additional travel restrictions model to reflect the continuing uncertainty of government interventions related to Covid -19. However, Skylark believes the use of the overlay Decay Function model potentially leads to an underestimate of traffic recovery which the CAA could challenge further.

Monte Carlo Analysis

The CAA should consider whether the lower performing scenarios are weighted appropriately given the material impact this has on the output.

Should the mooted risk-sharing arrangement be entered between HAL and Heathrow's airlines, it would seem reasonable to remove the upper and lower scenarios from the forecast altogether, and retain the mid case only.

Otherwise, Skylark believes the CAA's adjustment to be consistent with Q6, and reasonable. This is particularly so as applying a truncated distribution is even less appropriate during H7 given the headroom between the forecast and LHR capacity caps.

Shock Factor

Shock Factors are not, in Skylark's experience, a conventional part of a 'mid' forecast, as the presence of shocks is included in the outputs of a regression analysis of traffic drivers. This does not imply that their use is invalid, but if an additional factor is included, drivers should exclude the impact of shocks to avoid double-counting. It is understood that this exclusion is done by HAL and is part of the CAA model.

Assuming other drivers do exclude shocks, Skylark accepts the CAA's inclusion of a shock factor as reasonable, and also considers the application of a value of -1.07% to be reasonable.

Model Complexity

The model appears to have undergone a lengthy evolution with functionality gradually added. The various additions and overlays implemented to account for the pandemic, along with additional manual adjustments, reduces transparency and makes examination of the underlying inputs and drivers complex, compounding the asymmetry of information.



1. Introduction and Approach

Introduction

- Skylark was selected by the CAA to provide an independent third-party review of their current traffic forecast of Heathrow Airport ("LHR"). A later iteration of this forecast will be used to set Heathrow Airport Limited's ("HAL") price control arrangements for the upcoming regulatory period ("H7").
- The review is intended to improve confidence in forecast outputs by improving the robustness of the forecast approach and the associated model.
- The CAA's forecast model is based on HAL's forecast model with assumptions modified where the CAA's view diverged from that of HAL. Skylark has *not* undertaken a detailed review or audit of the model itself. The task as communicated by the CAA was to:
 - Review the CAA's use of the model as fit for purpose
 - Review the reasonableness, appropriateness, and completeness of the model drivers and input assumptions.
- Skylark does not offer an opinion on the absolute correctness of the CAA model outputs, or their relative correctness compared to the HAL Revised Business Plan.
- As well as reviewing the 'conventional' aspects of the forecast, Skylark has examined issues around the Covid-19 pandemic and the ongoing recovery. This factor dominates the short-term forecast.
- The review was conducted over a short term of three weeks which restricted the methodology to a high level analysis and precluded the opportunity to carry out a detailed interrogation of the HAL models or interviews of airlines and HAL itself.
- The review has been undertaken independently, with the CAA providing limited guidance such as outlining the model structure and answering specific queries. As detailed above no discussion, either verbal or written, has been entered into with HAL, airport users, or any other party.

Approach

Top-Down Review

- The overall approach was compared to industry best practice and conventional methodologies. Specifically the key assumptions and drivers of demand were verified. While all assumptions were reviewed, particular attention was applied to those assumptions where the CAA view varied materially from the HAL view.
- Consideration was given to:
 - The specifics of Heathrow's traffic mix (such as the relative bias to long-haul flights, the proportion of passenger transfers, and the business/leisure mix)
 - The relationship between Heathrow and other commercial airports serving London
 - The position of Heathrow as a transfer hub competing with other hubs such as Frankfurt or Paris CDG

Secondary Analysis

- To support Skylark's top-down views, a number of secondary analyses were conducted to test hypotheses. For example, the recovery profile related to other supply shocks was examined to inform views on general recovery behaviour at LHR. Relevant analyses are presented later in this document.

Review of Model Behaviour

- Skylark examined the materiality of major factors by varying input conditions to determine the impact on model outputs. Due to the project's time constraint and model complexity, this analysis was limited as previously described. However Skylark notes that, as far as it is aware, the CAA believes the model operates and performs in line with expectations. The Skylark findings supported this conclusion.
- The appropriateness of the Monte Carlo analysis was reviewed. Skylark also provided a view on the probability distributions and weighting of the factors (where known).

Primary Data Sources

- In addition to using subscription data sources and publicly available information, Skylark was granted access to:
 - The HAL RBP model (as updated in June 2021)
 - The CAA adjusted version of the HAL model (including a description of the amendments made to the HAL model)
 - Limited CAA correspondence on their model
 - Limited sections of RBP documentation concerning assumptions and model functionality



2. Market Share