

Estimating the cost of capital: technical appendix for the economic regulation of Heathrow and Gatwick from April 2014: Notices granting the licences

CAP 1155

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Table of Contents

Chapter 1: Summary	5
Chapter 2: Introduction	8
Chapter 3: Methodological issues	9
Chapter 4: Estimating the WACC: summary	13
Chapter 5: Estimating the WACC: gearing and the cost of debt.....	14
Chapter 6: Estimating the WACC: cost of equity	35
Chapter 7: Estimating the WACC: conclusions	44

CHAPTER 1

Summary

- 1.1 The CAA has decided to use a pre-tax real¹ weighted average cost of capital (WACC) of 5.35% for Heathrow Airport Limited (HAL) and 5.7% for Gatwick Airport Limited (GAL) for Q6.
- 1.2 The CAA's decision is the same as that included in its technical annex to the notices of the proposed licences published in January 2014 ('proposed licence'). This is lower than the CAA's October 2013 final proposals of 5.60% and 5.95% respectively because of a lower cost of equity resulting from a lower total market return (TMR) assumption. In reaching its view in the proposed licence in January 2014 the CAA considered stakeholder responses and evidence including the Competition Commission's (CC) provisional determination on Northern Ireland Electricity (NIE). In coming to the decision the CAA has considered the responses to the proposed licence.
- 1.3 The WACCs for both airport operators have reduced compared to the Q5 settlement² of 6.2% for HAL and 6.5% for GAL. The reductions mainly reflect reductions in corporate tax, the cost of debt and TMR since the previous settlement (2008/9 to 2013/14).

Approach

- 1.4 The CAA's approach to the WACC continues to assume notionally financed airport operators. The financing structure should remain the responsibility of the regulated company. The regulated companies and their shareholders should bear the risk of highly leveraged structures (or gearing above the notional gearing assumptions).
- 1.5 The CAA assumes gearing (debt to regulatory asset base (RAB)) of 60% for HAL (Q5: 60%) and 55% for GAL (Q5: 60%).

¹ All figures in this document are expressed in pre-tax real (i.e. inflation adjusted) terms unless otherwise stated.

² The Q5 headline WACC was 6.2% (HAL) and 6.5% (GAL), but the figures applied to the RAB to derive the actual capital charge were reduced to 6.01% and 6.3% respectively owing to the airport operators' ability to reinvest returns within the year. A similar automatic adjustment has not been made for Q6; instead the concept has been taken into account as one of the factors when deciding the point estimates within the range.

- 1.6 Throughout the review, the CAA's approach was a combination of a careful assessment of the individual components of the WACC and a top-down assessment of the WACC. Evidence was considered as a whole by the CAA to reach its proposals for the point estimates for the WACC.
- 1.7 The CAA received a report by Professor Puliur (Sudi) Sudarsanam³ called 'An expert's report on errors made by the Civil Aviation Authority in its conclusions on the cost of capital in the formulation of a price control for Heathrow Airport Limited for the sixth quinquennium (Q6) between 1 April 2014 and 31 December 2018'.⁴ The report was submitted by British Airways plc (BA) and Virgin Atlantic Airways Ltd (Virgin) both of whom endorsed its content and conclusions. The CAA sets out and takes account of this submission in the chapters which follow.

Cost of equity

- 1.8 The cost of equity is estimated using the Capital Asset Pricing Model (CAPM). The post-tax cost of equity estimates for HAL and GAL is the same as the proposed licence in January 2014 and is lower than the final proposals in October 2013 reflecting the lower TMR assumption. The beta assumptions are unchanged. The CAA has decided that the post-tax cost of equity is 6.8% for HAL and 7.0% for GAL. The lower TMR assumption compared to the final proposals in October 2013 reflects the evidence presented by the CC and the greater emphasis placed by the CC on forward-looking estimates (which tend to be lower than the long-run historical estimates).
- 1.9 The CAA continues to consider that it is not appropriate to include a specific uplift for skewed equity returns, something for which HAL had argued.⁵

Cost of debt

- 1.10 The CAA's cost of debt assumption, 3.2% for both HAL and GAL, is

³ Of Cranfield Business School, and previously a Member of the Competition Commission including the Group who conducted the inquiries into BAA Ltd for the purpose of the Competition Commission's recommendations to the CAA for the Q5 determinations for Heathrow, Gatwick and Stansted airports.

⁴ Published at <http://www.caa.co.uk/default.aspx?catid=78&pagetype=90&pageid=67>

⁵ HAL considered that similar to other investments it suffers in recessions but, relative to other investments, it cannot benefit when the economy is doing well owing to capacity constraints.

unchanged from the proposed licence (January 2014) and final proposals (October 2013). Several stakeholders considered that the CAA had made errors in its calculation. The CAA has assessed representations received to the proposed licence and responses to previous consultations and notes that although there are some reasons to suggest that the assumption might be lower or higher than 3.2%, on balance the evidence available suggests an estimate of 3.2% is appropriate.

CHAPTER 2

Introduction

- 2.1 This document sets out the CAA's reasoning for its assessments of the WACCs to apply to the Q6 price settlements for HAL and GAL. Unless otherwise stated this document refers to the pre-tax real WACC.
- 2.2 This document should be read in conjunction with Licence grant under Section 15 of the Civil Aviation Act 2012, Heathrow Airport Limited (CAP 1151) and Licence grant under Section 15 of the Civil Aviation Act 2012, Gatwick Airport Limited (CAP 1152), both published at the same time and available from the CAA's website.⁶
- 2.3 The remainder of this document is structured as follows.
- Chapter 3 considers **methodological issues** including whether adjustments need to be made for **skewed equity returns** and whether it is appropriate to introduce **debt indexation**.
 - Chapter 4 sets out the **overarching comments** received.
 - Chapter 5 assesses **gearing** and the appropriate value for the **cost of debt**.
 - Chapter 6 assesses **risk** and the appropriate value for the **cost of equity**.
 - Chapter 7 draws together the preceding chapters and assesses the appropriate **WACC** value.

⁶ <http://www.caa.co.uk/default.aspx?catid=78&pagetype=90&pageid=67>

CHAPTER 3

Methodological issues

- 3.1 This chapter considers the basic framework, skewed equity returns and debt indexation.

Basic framework

WACC and CAPM

- 3.2 The proposed licence concluded that, consistent with previous reviews and other regulated sectors, the WACC was the appropriate basis for estimating the cost of capital and that the two elements were the cost of equity (using the CAPM framework) and the cost of debt.
- 3.3 As the CAA has not received additional representations on this issue, the CAA's decision is, for the reasons set out in the proposed licence and previous consultations, that the WACC continues to be the most appropriate way to assess the cost of capital and the CAPM framework is the most appropriate way to assess the cost of equity.

Accounting rate of return

- 3.4 The accounting rate of return (ARR) is a concept that recognises that within a year returns can be reinvested, and therefore to earn the WACC by the end of the year, a lower cost of capital, the ARR, should be applied to the RAB. The ARR was used in previous quinquennia and is used in other, but not all, regulated sectors.
- 3.5 In the proposed licence, the CAA stated that since the WACC was ultimately a judgement within a plausible range of outcomes, formulaically applying the ARR might result in spurious accuracy. However, the CAA continued to consider that there was an argument for the consideration of the effect of the ARR because returns that are earned throughout the year can be reinvested. The CAA considered that it was, therefore, something the CAA should take into account when judging where in the range to adopt its proposals for the WACC.
- 3.6 As the CAA has not received additional representations on this issue, the CAA's decision is, for the reasons set out in the proposed licence and repeated above, that rather than apply mechanically, the ARR is

something the CAA will take into account when judging where in the range to adopt its point estimate for the WACC.

Skewed equity returns

- 3.7 Negatively skewed equity returns would mean that compared to other investments, an airport operator has more downside risk than upside potential. For example, the airport operator could suffer in recessions, but may not be able to benefit when the economy is doing well.⁷ If skewness exists and is material, investors with well diversified portfolios are concerned about the coskewness of the investment relative to the market generally.

Proposed licence

- 3.8 Building on previous consultations, in the proposed licence the CAA noted that beta and coskewness were likely to be driven by the same factor (excess demand over fixed capacity), and that as a consequence, if capacity tightens one would expect the beta to fall and negative coskewness to increase, other things being equal.
- 3.9 The proposed licence stated that in response to the final proposals HAL considered that for the period very shortly before de-listing an asset beta of 0.43 (the CAA used 0.50 in its proposed licence) was consistent with negative coskewness. In the final proposals the CAA noted this, but also considered that over a longer period, negative coskewness was not consistent with the beta estimate above 0.45. In the proposed licence the CAA stated that PricewaterhouseCooper (PwC) presented 14 years' worth of monthly data, and HAL's arguments focused on a small number of data points. Furthermore, in the proposed licence the CAA noted that using HAL's suggestion of an asset beta of 0.43, a negative coskewness coefficient of -0.46, and a

⁷ The CAPM assumes that share returns have a normal distribution. This distribution is symmetric, with equal chances of the same upside gain and downside loss. Because of this symmetry, risk can be fully described by the standard deviation (or equivalently by the variance). Professor Ian Cooper, on behalf of HAL, argued that when returns are not normally distributed, the CAPM is an incomplete model. Skewness means that the upside potential of a company's shares is different to their downside risk. Positive skewness means that upside potential is greater than downside risk, and negative skewness means that downside risk is greater than upside potential. In particular, Cooper argued when there is significant skewness of returns the standard deviation (and consequently the CAPM beta) is no longer an adequate description of risk. Furthermore, Cooper argued that skewness matters because it affects the desirability of an investment to investors and, hence, the cost of equity. Published at: <http://www.caa.co.uk/default.aspx?catid=78&pagetype=90&pageid=67>

coskewness premium of -1.9% the cost of equity was broadly the same as using an asset beta of 0.5 as shown in Figure 3.1.

Figure 3.1 Post-tax cost of equity using HAL's coskewness assumptions

Component	CAA's final view	HAL's suggested asset beta, coskewness coefficient and coskewness premium
Risk-free rate	0.5%	0.5%
Asset beta	0.50	0.43
Equity beta	1.10	0.93
Equity risk premium*	5.75%	5.75%
Coskewness coefficient	-	-0.46
Coskewness premium	-	-1.9%
Post-tax cost of equity	6.83%	6.69%

* the equity risk premium (ERP) is likely to be lower where a coskewness premium is also used. For simplicity the table uses the same ERP in both calculations.

Source: CAA calculations and page 31 of HAL's response to the final proposals

Decision

- 3.10 As the CAA has not received additional representations on this issue, the CAA's decision is, for the reasons set out in the proposed licence and previous consultations and summarised above, that it is not appropriate to include an allowance for coskewness in the cost of equity for Q6.

Indexation of the cost of debt

- 3.11 The CAA's cost of capital calculation includes a cost of debt assumption. In Q5 and previous quinquennia, the cost of capital and its components were fixed, ex-ante, for the quinquennium. An alternative approach (called indexation) is for the cost of debt and therefore the cost of capital to be updated in line with market movements during the control period.⁸

⁸ The cost of equity is often considered to be a long-run estimate and relatively unmoved by markets in the shorter run (i.e. during the control period). In contrast the cost of debt is considered to be more dependent on short-run market conditions which can change during the quinquennium.

Proposed licence

- 3.12 The CAA proposed that, on the balance of evidence set out in the Chapter 4 of final proposals (October 2013), it would not be in passengers' interests to introduce debt indexation for the airport operators for Q6.

Decision

- 3.13 As the CAA has not received additional representations on this issue, the CAA's decision is, for the reasons set out in the proposed licence and previous consultations, that it is not appropriate to index the cost of debt for Q6.

CHAPTER 4**Estimating the WACC: summary**

Representations received

- 4.1 As noted in paragraph 1.7 the CAA received a report by Professor Sudarsanam submitted by BA and Virgin both of whom endorsed its content and conclusions. The CAA considers this report in the chapters which follow.
- 4.2 In addition to the Sudarsanam paper, the CAA received representations on the proposed licence which referred to the WACC from HAL and the Heathrow Airline Community (London (Heathrow) Airline Consultative Committee (LACC) and Heathrow AOC Limited).
- 4.3 HAL stated that while its response did not comment in detail on policy issues or the building blocks (WACC, passenger forecasts etc) this should not be interpreted in any way as HAL agreeing with the CAA's assumptions, analysis or decision. HAL considered that the CAA's proposed WACC of 5.35% was flawed and did not accurately represent Heathrow's risk profile.
- 4.4 The Heathrow Airline Community welcomed the CAA's consideration of the CC's NIE investigation and its subsequent downward revision of the TMR. However, the Airline Community still believed, as it had highlighted in previous submissions, that the CAA had made a number of errors in its calculation of the WACC which resulted in the CAA setting a WACC that is higher than it should be.

CHAPTER 5**Estimating the WACC: gearing and the cost of debt**

Gearing**Proposed licence**

- 5.1 In the proposed licence the CAA proposed that the appropriate gearing should be 60% and 55% for HAL and GAL respectively. For HAL the gearing assumption was unchanged from Q5. For GAL the gearing in the proposed licence was 5% lower than Q5.
- 5.2 In the proposed licence the CAA considered that ultimately, the choice of gearing was a matter of judgement. The CAA placed some weight on the status quo to avoid unnecessary uncertainty. However, GAL's relative risk exposure is higher compared to HAL, specifically with respect to exposure to demand risk, implying a relatively smaller capacity for debt financing. The CAA considered that the difference in risk between HAL and GAL warranted a lower gearing assumption for GAL.
- 5.3 In the proposed licence the CAA noted that the Airports Consultative Committee (ACC) did not consider there was a rational basis for reducing the gearing assumption to 55% (from 60% in Q5) for a notionally efficient company of GAL's size, while also increasing the beta. In the proposed licence the CAA stated that it continued to consider, for the reasons set out in PwC's work and the initial and final proposals, that GAL's risk profile is such that the appropriate gearing assumption for GAL should be slightly lower than HAL. The cost of GAL's actual debt is lower than that of HAL and, as noted in the final proposals, this is explained by the differences in timing of the issuances.
- 5.4 The CAA noted that it considered the level of gearing in the notional capital structure was an important assumption and input into the assessment of financeability and ultimately whether the price cap met the CAA's requirements to have regard to:

- the need to secure that each holder of a licence is able to finance its provision of airport operation services; and
- the need to promote economy and efficiency on the part of each holder of a licence.

- 5.5 The CAA stated that if notional gearing was too low, then the notional financial structure may not be economic or efficient. The CAA noted that it is generally considered that the post-tax WACC increases as gearing falls because of a reduced tax shield on debt.
- 5.6 The CAA also noted that if the notional gearing assumption was too high then the notional airport operator might find it difficult to finance its operations. The CAA stated that its financeability testing in the main documents⁹ supported the view that the notional airport operator would be able to finance its operations at the assumed gearing of 60% and 55% for HAL and GAL respectively. Furthermore, the ratios suggested that there was scope to absorb downside shocks and maintain an investment grade rating, but that the level of the buffer was not so large as to suggest significant inefficiency in the assumed gearing levels.
- 5.7 The CAA noted that the CC's NIE provisional determination assumed a gearing level of 50% and this suggested that the CAA's assumptions were broadly correct.

Decision

- 5.8 As the CAA has not received additional representations on this issue, the CAA's decision is, for the reasons set out in the proposed licence and repeated above, that it is appropriate to use gearing of 60% and 55% for HAL and GAL respectively.

Cost of debt

- 5.9 This section considers the cost of debt issue by issue. Within each issue the CAA sets out the proposed licence, the representations received (if appropriate) the CAA's assessment of the representations (if appropriate) and the CAA's decision.

⁹ 'Economic regulation at Heathrow from April 2014: notice of the proposed licence' and 'Economic regulation at Gatwick from April 2014: notice of the proposed licence'.

Proposed licence

- 5.10 The cost of debt in the proposed licence was 3.2% for HAL and GAL. This was lower than the Q5 determination (3.55% for both airport operators).

Figure 5.1: Cost of debt range including fees in the proposed licence

	HAL	GAL
Historical fixed rate debt (70%)	3.30%	3.10%
New debt and floating rate debt (30%)	2.50%	2.75%
Cost of debt excluding fees	3.05%	3.00%
Fees	0.15%	0.20%
Cost of debt including fees	3.20%	3.20%

Source: proposed licence

Representations received

- 5.11 The CAA received representations from Sudarsanam on behalf of BA and Virgin. Professor Sudarsanam made points on the calculation of the cost of existing debt and points on the calculation of the cost of new debt. These are taken in turn.

Review of Q5

Proposed licence

- 5.12 In response to the final proposals, BA was critical of the CAA's use of Bank of America Merrill Lynch (BoAML) bond indices. The CAA considered that the purpose of the comparison of the Q5 cost of debt assumption to actual yields during Q5 (using BoAML indices) was to provide background to the Q6 review and to assess the claim that airport operators had been under rewarded during Q5.

Representations received

- 5.13 Sudarsanam considered that the BoAML indices were not appropriate for either the review of Q5 or the estimation of the cost of debt for Q6. This is assessed in paragraph 5.55 below.

Approach to the assessment of the cost of debt

Proposed licence

- 5.14 The CAA had previously stated (in the initial and final proposals) that it