

**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**

**REPORT OF
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Specialist Field : Cost of Capital
On Behalf Of : British Airways Plc and Virgin Atlantic Airways Ltd
Prepared For : Civil Aviation Authority / Competition Commission
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1 INTRODUCTION

1.1 Experience and Credentials

- 1.1.1 I am Emeritus Professor of Finance & Corporate Control at the Cranfield University School of Management, Honorary Senior Visiting Fellow at the Cass Business School, London and visiting professor in Mergers & Acquisitions at Imperial College Business School, London, three of the most prestigious business schools in the UK and the world. I was also Professor of Finance & Accounting at the Cass Business School earlier. I have taught the following courses on Master's and MBA programmes: corporate restructuring/ turnaround; bankruptcy modeling; mergers and acquisitions; corporate valuation; cost of capital; and private equity. I have also published in top refereed journals in these areas (see Appendix 1 for a list). Most of my research has involved modelling cost of capital using CAPM, three / four factor models etc.
- 1.1.2 I was appointed as a Reporting Panel Member of the Competition Commission ("CC") in 2005 and was a member of the CC's expert panel on cost of capital and regulatory finance (the Finance & Regulation Group or FRG) from 2006 to 2013. I was involved in the preparation of eight determinations in relation to cost of capital issues including two appeals in 2010-11 by Carphone Warehouse under section 193 of the Communications Act 2003 (the "Communications Act"), the economic regulation of Heathrow and Gatwick in 2007, the economic regulation of Stansted in 2008 and Bristol Water price determination in 2010.¹ I was a member of several inquiry teams, a member of the expert FRG panel advising other inquiry groups on cost of capital and financeability issues and in some inquiries both. I stepped down from the CC in March 2013. As a member of the UK Competition Commission I gained experience in merger inquiries and price control regulatory proceedings. I have much experience of evaluating the adversarial arguments submitted by parties to disputes in these areas.
- 1.1.3 I am the author of *Market and Industry Structure and Corporate Cost of Capital*, Journal of Industrial Economics (1992) and *Cost of Equity for Regulated Companies: An International Comparison of Regulatory Practices*, Competition Commission UK, Discussion paper, (2011).
- 1.1.4 I have published extensively in leading academic journals like Financial Management, Journal of Banking & Finance, European Finance Review, European Financial Management and Journal of Industrial Economics. I have presented numerous research papers at leading conferences in Europe and the USA. I have been an associate editor of the Journal of Business Finance & Accounting and am an associate editor of Review of Behavioral Finance.
- 1.1.5 My full curriculum vitae is attached as **Appendix 1**.

¹ The Carphone Warehouse Group plc v Office of Communications, Case 1111/3/3/09. BAA Ltd: A report on the economic regulation of the London airports companies (Heathrow Airport Ltd and Gatwick Airport Ltd, presented to the Civil Aviation Authority, September 2007; Stansted Airport Limited: Q5 price control review, presented to the Civil Aviation Authority, October 2008; Bristol Water plc, report presented to Ofwat on 4 August 2010.

1.2 Instructions

- 1.2.1 I have been instructed by Baker & McKenzie LLP, on behalf of British Airways plc ("BA") and Virgin Atlantic Airways Ltd ("Virgin"), to prepare this report for submission to the Civil Aviation Authority ("CAA") as part of its statutory consultation pursuant to Section 15(1) of the Civil Aviation Act 2012 (the "Act"). I understand that it may also be submitted to the CC (and, hence, its successor the Competition and Markets Authority) in the event of an appeal by BA and/or Virgin and/or Heathrow Airport Limited ("HAL") and I have prepared my report on that basis. In particular, I have adhered to the standards of an independent expert appearing before a court or tribunal.
- 1.2.2 I set out, in Appendices 2 and 3, a list of the written instructions I have received from Baker & McKenzie LLP and the materials that I have considered in the preparation of this report.

1.3 Disclosure Of Interests

- 1.3.1 I can confirm that I do not have any actual or potential conflict of interest with any of the parties involved in this matter whose identities have been advised to me by Baker & McKenzie LLP.

1.4 Synopsis

- 1.4.1 This is the first time that the CAA has set a price control for Heathrow Airport under the new regime created by the Act. Whereas it was previously the case that the CC would always prepare a report on all price control issues for consideration by the CAA in reaching its final decision, I understand that the situation is now different and that the CC will only be involved to the extent that it is alleged that the CAA has erred. I am told that I should assume that the CC would apply a similar standard of review to that which it has adopted in references under section 193 of the Communications Act. In particular, I appreciate that it is not enough simply that I would have adopted a different approach to the CAA if I were in their position. The CC will only intervene if the CAA has made an error of fact, law or judgement.
- 1.4.2 I have been asked to consider particular issues in relation to the CAA's provisional conclusions² on HAL's cost of capital by reference to this standard of review. I set out my conclusions in full at the end of the report. In briefest summary, however, I consider that the CAA has erred and has overstated the cost of capital for HAL as a result.
- 1.4.3 My analysis is structured as follows:
- (a) **Inflation.** Many of the inputs used by the CAA in its formulation of an appropriate cost of capital have been converted from nominal to real values. Those instructing me are concerned that the CAA did not convert the relevant values accurately or appropriately.

² I was initially instructed by reference to the position of the CAA set out in its document Economic regulation at Heathrow from April 2014: final proposals (CAA, October 2013) (the "Final Proposals") but have since also taken account of the CAA's position in its document Economic regulation at Heathrow Airport from April 2014: notice of the proposed licence (CAA, 10 January 2014) (the "Section 15(1) Notice"). I appreciate that this is not the final decision of the CAA and that it may still change before the time for any appeal.

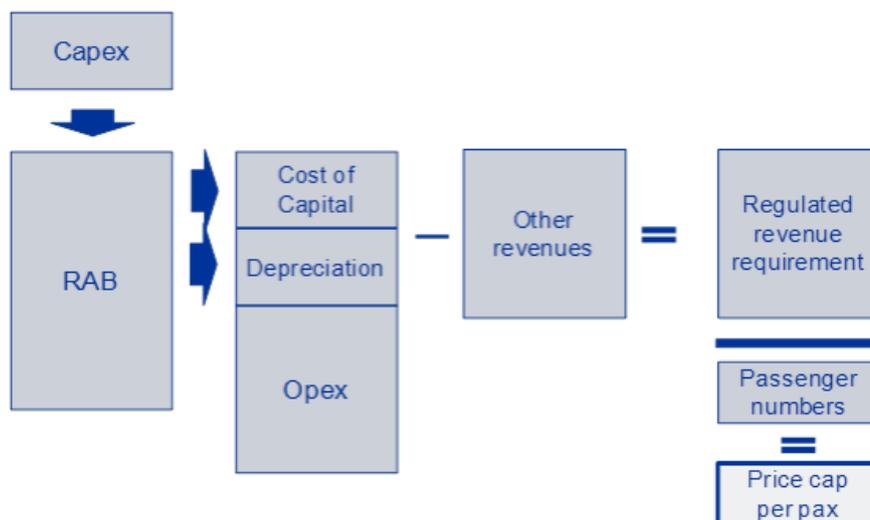
The points raised in this respect apply to both embedded and new debt so I deal with it separately as a preliminary point.

- (b) Cost of embedded debt. The CAA used evidence of HAL's actual bonds as well as evidence from benchmark indices in order to estimate the cost of HAL's embedded debt. Those instructing me are concerned that the CAA may have made errors in relation to both elements. In particular, they consider that the CAA: used inappropriate benchmark indices; wrongly excluded non-sterling debt; wrongly included subordinated debt; and wrongly failed to exclude re-financing incentives.
 - (c) Cost of new debt. Again, the CAA looked at two sources in forming its views on the cost of new debt. It considered benchmark indices and evidence of the traded yields on HAL's actual bonds. Those instructing me are concerned that the CAA may have made errors in relation to both elements. In particular, they consider that the CAA: inappropriately relied on a single cut-off date for the indices; wrongly taken account of subordinated debt in considering traded yields; and made computational errors in deriving the average traded yields. I have also been asked to consider the appropriateness of two comparators relied on by the CAA to demonstrate the reasonableness of its decision on the cost of debt: namely a bond issue by HAL in October 2013 and the provisional determination of the CC on the cost of debt faced by Northern Ireland Electricity.
 - (d) Cost of equity. Those instructing me have asked me to consider the appropriateness of the equity beta used by the CAA.
- 1.4.4 The approach I have adopted in setting out my analysis will be familiar to any reader of a CC determination. I have briefly outlined the nature of each issue, set out the arguments of the parties on the issue and then set out my opinions with reasons for the same.
- 1.4.5 In the next section of this report, before I set out my analysis, I provide further background on the form of the price control adopted by the CAA and the process followed to reach the provisional conclusions in order to put the rest of my report in its proper context.

2 BACKGROUND TO THE CASE

2.1 The form of price control imposed

- 2.1.1 The existing price control for HAL took effect from 1 April 2008 until 31 March 2013 (Q5) and was then extended by one year to allow for the introduction of a new regulatory regime.
- 2.1.2 The new regime for Q6 required the CAA to make a market power determination before imposing any kind of economic regulation on HAL, which it has now done, and also gave it flexibility to consider alternative forms of regulation. The CAA did look at alternatives but ultimately concluded that it would be appropriate to adopt much the same form of price control for Q6 as was used in Q5.
- 2.1.3 For both Q5 and Q6, the CAA has adopted what is known as a "RAB-based" price control. The RAB is the "Regulated Asset Base", being the depreciated value of all regulated assets. This form of control will no doubt be familiar to the CC from other regulated industries. The constituent elements of the control in the specific context of HAL can be illustrated as follows (using a diagram produced by the CAA)³:



- 2.1.4 The final control is expressed in the form of an RPI-X control. The control that the CAA proposes to impose in the Section 15(1) Notice is RPI-1.5%. It was originally intended that the control would run for five years (a quinquennium) between 1 April 2014 and 31 March 2019 but the CAA has provisionally decided in the Section 15(1) Notice that the control period should be shortened to end on 31 December 2018 so as to align control periods with financial years for HAL.

³ Figure A.2 in the Section 15(1) Notice.

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- 2.1.5 This report concerns only the cost of capital element of the control. The CAA has determined that the appropriate weighted average cost of capital ("WACC") for HAL for Q6 is 5.35% on a pre-tax real basis. This equates to a "vanilla WACC" of 4.66%.⁴ All else being equal, each basis point (0.01%) on the pre-tax real WACC is worth approximately 2 pence per passenger⁵ and it is forecast that there will be 347.7 million passengers between 1 April 2014 and the end of 2018.⁶
- 2.1.6 The cost of capital element is itself built up on the basis of the following sub-elements:
- (a) Cost of debt, divided between embedded debt (i.e. existing debt that it is assumed will not be replaced in Q6) and new debt;
 - (b) Cost of equity, which can be further sub-divided into equity beta, asset beta and total market return (itself split between risk-free rate and equity risk premium); and
 - (c) Gearing, setting the assumed ratio between debt and equity.
- 2.1.7 I have not been asked to provide an opinion on the CAA's assumptions as to the appropriate level of gearing (60% debt) though it is relevant to some of the other issues I have been asked to address on the cost of debt.
- 2.1.8 The CAA's provisional conclusions on the constituent elements of the WACC are as set out in the table below⁷:

%	Final Proposals range	Final view point estimate
Gearing	60	60
Pre-tax cost of debt	2.78 - 3.45	3.20
Total market return	6.25 - 6.75	6.25
Risk-free rate	0.50 - 1.00	0.50
Equity risk premium	5.75	5.75
Asset beta (number)	0.42 - 0.52	0.50
Equity beta (number)	0.90 - 1.15	1.10
Post-tax cost of equity	5.68 - 7.61	6.84
Tax rate	20.2	20.2
Pre-tax cost of equity	7.11 - 9.54	8.58
Pre-tax WACC	4.51 - 5.89	5.35
Vanilla WACC	3.94 - 5.12	4.66

⁴ Paragraph I4, Section 15(1) Notice.

⁵ Figure Ex. 1 in the Section 15(1) Notice shows a decline of 47 pence per passenger attributed to the 25 basis point reduction in pre-tax real WACC between the Final Proposals and the Section 15(1) Notice.

⁶ Paragraph 4 of the Executive Summary, Section 15(1) Notice.

⁷ Extracted from Figure 7.1, Estimating the cost of capital: a technical appendix for the economic regulation of Heathrow and Gatwick from April 2014: Notices of the proposed licences (CAA CAP 1140, 10 January 2014) (the "Section 15(1) Technical Appendix").

2.2 The process followed by the CAA

- 2.2.1 The full process followed by the CAA in formulating the price control for HAL is set out in the Section 15(1) Notice.⁸ For present purposes, it is sufficient to refer to three stages:
- (a) Initial Proposals issued in April 2013;
 - (b) Final Proposals issued in October 2013; and
 - (c) Section 15(1) Notice issued on 10 January 2014.
- 2.2.2 The CAA obtained advice from PricewaterhouseCoopers (PwC) on its approach to the cost of capital. PwC reports were published alongside both the Initial Proposals and the Final Proposals.
- 2.2.3 A technical appendix on WACC prepared by the CAA was published alongside each of the Final Proposals and the Section 15(1) Notice.
- 2.2.4 Parties consulted by the CAA provided consultants' reports on aspects of the WACC in response to the documents set out above and at earlier stages in the process.
- 2.2.5 The Section 15(1) Notice commences a short two-week period of statutory consultation. I understand that the CAA has indicated that it "*expects stakeholders to focus their responses on the technical aspects of the licence conditions, i.e. how they would operate, rather than the policies that stand behind them*"⁹ but I am told by those instructing me that the rules governing appeals indicate that evidence may not be admissible on appeal if it is not submitted during this two-week period. I have therefore been asked to prepare this report for submission to the CAA at this stage notwithstanding that it may go beyond the CAA's expectations for representations at this time.
- 2.2.6 The CAA has indicated that it expects to publish its final notice (the "Section 15(5) Notice") issuing a licence to HAL on or about 14 February 2014. I am told that it is the Section 15(5) Notice that will be potentially subject to appeal.

⁸ See paragraph 1.16, Section 15(1) Notice.

⁹ Paragraph 1.5, Section 15(1) Notice.

3 INFLATION

3.1 Overview

3.1.1 I have been asked to provide my opinion on a single issue in relation to inflation. The question to be answered and my summary answer is as follows:

- **Has the CAA erred in how it has taken account of inflation in its estimates for the cost of debt?** In particular, I am asked to address whether the CAA should have used the Fisher formula to deflate nominal values and whether it should have made greater adjustments to figures produced by PwC given the CAA's conclusion that inflation was likely to be greater than PwC had forecast. My conclusion is that the CAA should have used the Fisher formula and should have made greater adjustments to reflect the difference between its inflation forecast and that used by PwC.

3.1.2 As the CAA has explained, inflation assumptions in the cost of debt calculation are required because corporate debt yields are expressed in nominal terms (ie include an allowance for inflation) and the CAA (and most other regulators) set a real cost of capital (ie excluding an allowance for inflation).¹⁰

3.2 Has the CAA erred in how it has taken account of inflation in its estimates for the cost of debt?

3.2.1 PwC, in its advice to the CAA in April and October 2013, assumed a point estimate of expected RPI of 2.8%. Throughout its estimation of various cost of debt parameters, PwC deflated the nominal yields by subtracting 2.8% from estimates of nominal values to derive real values; i.e. using the approximate additive formula rather than the correct multiplicative Fisher formula to deflate.

3.2.2 The CAA indicated in the Technical Appendix to its Final Proposals that it considered a range of 3.0-3.1% as appropriate. It used this lower range elsewhere in its price cap modelling.¹¹ The CAA recalculated the real cost of new debt to take account of the difference in inflation forecasts by reducing the real cost estimate made by PwC by 10 basis points. It did not make any adjustment to the estimated cost of embedded debt for this reason.

BA's criticisms of the CAA's approach

3.2.3 BA contends that the CAA erred in adopting PwC's figures for the cost of new and embedded debt without making a proper adjustment for the difference in the RPI inflation assumed by PwC and the CAA respectively.

¹⁰ Paragraph 5.42, Section 15(1) Technical Appendix.

¹¹ Paragraph 6.60, Final Proposals Technical Appendix.

3.2.4 It contends that the CAA should have reduced PwC's estimate of the cost of new debt by 20-30 basis points rather than 5-10 basis points. It contends that the CAA should have reduced PwC's estimate of the cost of embedded debt by 20-30 basis points instead of making no adjustment at all.

3.2.5 BA also contends that both PwC and the CAA should have used the Fisher formula.

HAL's position

3.2.6 HAL has not addressed BA's arguments in this respect.

The CAA's response in the Section 15(1) Notice

3.2.7 The CAA has not directly addressed BA's argument other than in relation to use of the Fisher formula, which it accepts "*is theoretically preferred*" but rejects it on the basis that "*the simple deduction method used by the CAA in some of its analysis is within the margin of accuracy of the underlying inflation estimate*".¹² On inflation generally, the CAA has responded to BA's criticisms in the following terms:¹³

- (a) It says that estimating investors' expectations of inflation is not easy and that a number of different sources exist. It says that recent inflation has been 2.6%, that independent and government forecasts range from 2.8% to 3.5% for the period up to 2018 and that breakeven inflation based on gilts ranges from 2.7% to 3.7%. It also refers to the CC's provisional determination in NIE, noting that the CC used a figure of 2.8% for embedded debt and the mid-point of the range from 2.7-3.2% for new debt.
- (b) It has re-characterised its position in the Final Proposals, now saying merely that it "undertook some analysis using an inflation rate of 3%".
- (c) It asserts that "Ultimately the choice of inflation estimate is a matter of judgement. While other inflation rates are also plausible, the CAA considers that its assumptions as an estimate of the expected future inflation rate contemporaneous with the market data are appropriate and within the range of plausible estimates." It does not clarify what assumption or assumptions it is using for RPI in the Section 15(1) Notice but all WACC figures are the same in the Section 15(1) Notice as in the Final Proposals except for the TMR and risk-free rate, which have been amended to be more consistent with the position adopted by the CC in the NIE provisional determination.

My assessment

3.2.8 In providing my assessment, I will deal first with the question of whether the CAA should have used the Fisher formula in deflating nominal values for the cost of debt and then consider whether the CAA has erred in how it has adjusted, or failed to adjust, for the difference in inflation forecasts between itself and PwC.

¹² Footnote 14, Section 15(1) Technical Appendix.

¹³ Paragraphs 5.44-47, Section 15(1) Technical Appendix.

- 3.2.9 The Fisher formula adjusts the nominal cost of borrowing for the effects of expected inflation. It is used in deflating nominal values rather than a simple additive formula because the simple additive formula ignores the interaction between the real rate and the inflation rate. As such, simple logic dictates that the Fisher formula should be used rather than the approximate additive formula. The CAA accepts as much¹⁴ and it is the approach used by the CC. In its Q5 Stansted determination, the CC chose the Fisher formula (Competition Commission, Stansted Airport Limited Q5 price control review, 23 October 2008, para 37, p674). It followed the same approach in its Bristol Water determination (Competition Commission, Bristol Water plc Report, 4 August 2010, Table 3, p N13) and the more recent NIE draft determination (Competition Commission, Northern Ireland Electricity Draft determination, ch 13, Table 13.4, p13-22).
- 3.2.10 It is easy to implement the Fisher formula so I do not know why the CAA has used the approximate additive formula instead. It has not given any reason beyond an indication that it considered the approximate additive formula sufficiently accurate given the margin of accuracy for the underlying inflation estimate. I do not consider this to be an acceptable justification when it introduces an easily avoidable element of inaccuracy. The fact that the underlying estimate is not in any case accurate is not a good enough reason for making it even less accurate.
- 3.2.11 In circumstances where the CAA has consciously chosen to use a value for inflation that is at the lower end of its plausible range this inevitably increases the likelihood that the price control will not sufficiently take account of the effects of inflation and overestimate the cost of debt.
- 3.2.12 Moreover, even if the effect of using the Fisher formula may be relatively modest in the context of this price control, I note that a number of small errors, or short-cuts, can add up to something more significant including in the present situation where BA has identified a number of other errors affecting the cost of debt. As I noted in the introduction, each basis point added to the WACC adds approximately 2 pence per passenger to airport charges, or approximately £7m over 4 years and 9 months. Thus I consider that the CAA erred in failing to use the Fisher formula.
- 3.2.13 On the alleged error over failure to adjust (or adjust sufficiently) for the difference in inflation forecasts between PwC and the CAA, I agree with BA that the CAA has erred in that the adjustments made by the CAA do not fully account for the difference in the inflation forecasts used by itself and PwC.
- 3.2.14 I note that the CAA now appears to suggest in the Section 15(1) Notice that it did not necessarily adopt the forecast of 3.0-3.1% inflation in the Final Proposals and that it merely "undertook some analysis using an inflation rate of 3%".¹⁵ I would have to question whether this is consistent with the position that the CAA set out in its Final Proposals. It said the following in that context:

14 Footnote 14, Section 15(1) Technical Appendix.

15 Paragraph 5.47, Section 15(1) Technical Appendix.

"When converting nominal yields to real yields PwC assumed an inflation rate of 2.8%. The CAA has examined inflation forecasts from a variety of sources including the Office of Budgetary Responsibility, Consensus Forecasts and HM Treasury's survey of independent forecasters, which suggest that RPI inflation over Q6 is expected to be in the range 3.0% to 3.4%. Furthermore, the CAA's price cap modelling assumes inflation in the region of 3.0 to 3.1%. Therefore, the CAA considers that there are reasons to expect that inflation could be more likely to be above PwC's assumption than below it (c10 to 20 basis points). The CAA has taken this into account when assessing the appropriate point in the range for the cost of debt."¹⁶

- 3.2.15 I read this as a clear indication that the CAA did not agree with PwC's forecast and had chosen to use a different figure. Moreover, it did actually make some adjustment to reflect a higher assumed inflation rate (lowering the cost of new debt by 5 to 10 basis points). I fully accept that "the choice of inflation estimate is a matter of judgement"¹⁷ and I would not seek to impugn a judgement to assume RPI inflation of 3.0-3.1% over Q6 even though I, personally, consider this to be a low estimate by reference to recent independent forecasts. The CAA's approach raises concerns about consistency and computational logic. It would be internally inconsistent for the CAA to use an inflation estimate of 3.0-3.1% for some of its price cap modelling and a different rate for the WACC.
- 3.2.16 It would also be internally inconsistent to use one inflation rate for new debt and a different one for embedded debt, which is what the CAA has effectively done in making an adjustment to the one set of figures and not the other. Moreover, I can see no computational logic for adjusting the cost of new debt by only 5 to 10 basis points in circumstances where the CAA is using an inflation forecast of 3.0-3.1% and its advisers were using a forecast of 2.8%. Simple arithmetic tells one that the adjustment should have been 20 to 30 basis points (leaving aside the Fisher formula for now). I also note that I cannot see why the CAA referred to "*c10 to 20 basis points*" in the quotation from the Final Proposals above as it does not seem to flow from the discussion in the document but, in any event, what the CAA actually did in terms of adjusting the cost of debt still is not consistent even with that comment.
- 3.2.17 I note that the CAA claims that the inadequate adjustment for its own higher inflation expectations than PwC's is a matter of regulatory judgement but any such claim of the use of judgement needs to be justified by a clear rationale to avoid being seen as arbitrary. I am aware of no such explanation at this time. Exercise of judgement by a regulator has to be guided by reason and objectivity and must be seen to be so guided. Mere assertion that it has exercised its regulatory judgement, unsupported by such reason and objectivity, is not consistent with good regulatory practice.

¹⁶ Paragraph 6.60, Final Proposals Technical Appendix.

¹⁷ Paragraph 5.47, Section 15(1) Technical Appendix.

4 COST OF EMBEDDED DEBT

4.1 Overview

4.1.1 The CAA uses two alternative methods to estimate the cost of embedded debt:

- (a) Evidence of HAL's actual bonds; and
- (b) Evidence from benchmark indices.

4.1.2 I have been asked to provide my opinion on issues related to both methods. The questions I have been asked to address and my summary answers are as follows:

On HAL's actual bonds:

- **Did the CAA err when it chose to exclude non-sterling debt issued by HAL?** I conclude that the CAA did err in excluding non-sterling debt because doing so artificially inflates the average tenor of HAL's debt and thereby increases the cost of debt.
- **Did the CAA err when it chose not to exclude subordinated debt issued by HAL with a credit rating of BBB or BB?** I conclude that the CAA did err in failing to exclude BBB and BB rated debt from its calculation. HAL's actual performance over Q5 shows that a notional efficiently financed airport in HAL's position would not have needed to issue any debt with less than an A- rating if it maintained the 60% gearing that the CAA assumes a notional airport would maintain.
- **Did the CAA err in failing to exclude re-financing incentives?** I conclude that the CAA did err in failing to exclude re-financing incentives. The factual evidence indicates that HAL provided incentives to its lenders to accept a refinancing arrangement with less restrictive covenants. Those incentives offer no benefits to passengers and were rightly excluded by the CC in its Q5 determination. They should have been excluded this time as well.

On the use of benchmark indices:

- **Did the CAA err in using benchmark indices including bonds issued by financial institutions?** I conclude that the CAA did err in this respect. In its Q5 decision, the CAA quite deliberately chose to use a benchmark index excluding bonds issued by financial institutions in order to avoid artificially increasing the cost of debt as a consequence of the unusual circumstances affecting financial institutions. I see no justification for adopting a different approach on this occasion.

- 4.1.3 I have additionally been asked to provide my opinion on what cost of embedded debt the CAA should have applied if it had not made the errors discussed above. In doing this, I have additionally taken account of the inflationary error discussed in section 3 of this report. The values to adopt will depend not only on how one chooses to correct the individual errors but also on whether one places more weight on the evidence of HAL's actual bonds or on the evidence derived from benchmark indices.
- 4.1.4 As a general point, it is important that evidence from either method – benchmark indices or actual bonds – is not tainted by any error. Where an inappropriate benchmark index is chosen leading to an inflated benchmark cost of debt and an inappropriate portfolio of actual bonds is chosen leading to an inflated actual cost of debt, the two estimates may be mutually supportive leading to a semblance of accuracy. Such apparent precision must be seen to be the result of two errors compounding each other and not as the outcome of a robust methodological process. To assume that the similarity of estimates enhances the credibility of the determination is to be lulled into a false sense of reliability and misplaced confidence.
- 4.1.5 I therefore consider whether there are errors in the choice of benchmark indices and in the choice of the relevant portfolio of HAL's actual bonds and how these errors lead to errors in the estimate of the cost of embedded debt for HAL. I also highlight whether these errors reinforce one another in such a way as to create a (false) appearance of robustness in the CAA's estimates.
- 4.1.6 My views on the individual corrections and the overall corrected cost of embedded debt can be summarised as follows:

Issue/ Airlines' position	CAA position	My numerical correction/ position
HAL's actual bonds(nominal)		
Inclusion of non-sterling debt	No need since sterling debt proxies for non-sterling debt	- 37 basis points
Exclusion of BBB and BB debt	Exclusion of BB debt makes no material difference	At least - 46 basis points ¹⁸
Exclusion of refinancing incentives	Not considered	- 17 basis points
Benchmark indices (nominal)	<ul style="list-style-type: none"> • BoAML index including financials used to validate Q5 CoD; • Same index used to derive cost of embedded debt in Q6; 	<ul style="list-style-type: none"> • Inappropriate, but not providing a corrected alternative. • Inappropriate. I do not have access to the index used by the CAA for Q5 so do not offer a view on the right value to use.

¹⁸ I have only been able to look at the impact of removing BB debt. I do not have the data to calculate the impact of removing BBB debt.

Issue/ Airlines' position	CAA position	My numerical correction/ position
Adjustment for difference in PwC and CAA inflation forecasts	None.	-20 to 30 basis points
Overall cost of embedded debt (after inflation)		At least -120 to -130 basis points (subject to comparison with data from an appropriate benchmark index)

4.2 HAL's actual bonds: did the CAA err when it chose to exclude non-sterling debt issued by HAL?

- 4.2.1 In its estimation of the cost of HAL's embedded debt, PwC excluded non-sterling denominated bonds based on the argument that "it would be inappropriate to include the YTM at issuance on non-GBP denominated bonds without making any allowance for the conversion cost to sterling (including currency transaction and hedging costs)" (PwC Report, October 2013, p33).
- 4.2.2 PwC considered the alternative options available: to incorporate currency hedging costs on bonds issues in foreign currencies or to treat the UK sterling issues as appropriate benchmarks for the cost of debt on the assumption that "*airports trade-off issuing debt in different international markets and will move to international markets both to diversify funding sources and lower issue costs compared to relying solely on UK sterling corporate bond markets*" (p33, *ibid*).
- 4.2.3 PwC also noted a second order impact of HAL issuing non-sterling debt i.e. it does not consume capacity in sterling markets which "*could impact both primary and secondary pricing*". PwC avoided taking this impact into account because it would be "*highly subjective*" and stuck to its assumption that the sterling market is an appropriate benchmark for all of HAL's debt (fn 49, p33, *ibid*).
- 4.2.4 The CAA in its Final Proposals adopted the assumption made by PwC but further elaborated on it. It said: "an alternative approach is to assume that the all-in cost of non-sterling bonds is the same as the cost of sterling bonds. The logic here being that HAL would issue bonds in whatever market was the cheapest and therefore the cost of bonds, once the swap/hedging costs are taken into account should be approximately the same in all markets into which HAL issues. Hence the cost of the sterling bonds are used as an estimator of the cost of non-sterling bonds" (CAA Final Proposal, Technical Appendix, para 6.44, p 46).
- 4.2.5 It is worthy of note that PwC believed that recourse to non-sterling markets enabled HAL to lower issue costs than relying solely on UK sterling corporate bond markets. By contrast, the CAA believed or assumed that the cost of bonds, once the swap/hedging costs were taken into account, should be approximately the same in all markets where HAL raised debt.

BA's arguments against exclusion of non-sterling debt

- 4.2.6 BA argues that the CAA's decision to exclude non-sterling debt was wrong because it ignored the impact on the average tenor of the debt considered by the CAA. The non-sterling debt was much shorter tenor debt than the sterling debt. The result of excluding it was to use only longer tenor debt for estimating HAL's cost of embedded debt. This inflated the cost of HAL's embedded debt since cost of debt increases with tenor (BA's Response to CAA's FP, Annex B, pp26-31).
- 4.2.7 BA suggests two alternative procedures for correcting this error:
- (a) Revalue non-sterling debt by reference to sterling debt and add it to the overall debt; or
 - (b) Adjust the average tenor of sterling debt to factor in the shorter tenor of non-sterling debt.
- 4.2.8 BA estimates the YTM of HAL's non-sterling bonds using a regression model of the relationship between YTM and the bond tenor for sterling bonds. It calculates the tenor of non-sterling bonds to the same maturity dates as HAL's sterling bonds and uses the traded yields of the latter at the time of issuance of the former for those maturities (pp28-29, *ibid*). This allows BA to calculate what a sterling-equivalent of the non-sterling bond would cost in terms of YTM. This calculation is repeated for the tenor of each non-sterling bond across the range of sterling bonds issued by HAL.
- 4.2.9 Having derived a set of tenor vs YTM data for each non-sterling bond, BA estimates the regression model, now for each such bond. This provides an estimated sterling cost for each non-sterling bond tailored to its tenor. For example, the tenor of the Euro bond issued by HAL on 12 October 2010 is 6 years and the estimated sterling cost is 4.26% (p29, *ibid*).
- 4.2.10 With this procedure, BA estimates that the cost of HAL's embedded debt combining both sterling and non-sterling bonds is 5.17% (after incorporating the changes based on the removal of subordinated debt and the incentive elements in the re-financing bonds issued in 2008 discussed in sections 4.3 and 4.4 below). This amounts to a reduction in the cost of HAL's embedded debt by 37 basis points (pp30-31, *ibid*).

HAL's response

- 4.2.11 HAL agrees in principle with BA's analysis of the impact of the shorter maturity of non-sterling debt but suggests a simpler estimation procedure than BA's described above. It is also concerned that BA's regression methodology is not free of estimation errors (HAL's Response to BA's Response, November 2013, pp9-10).
- 4.2.12 HAL suggests that one should take the dates of non-sterling issues by Heathrow, look at the maturity of the relevant bond and derive a sterling yield from an equivalent duration Heathrow bond outstanding at the same time.

- 4.2.13 HAL provides an illustrative example: for the 6 year Euro denominated bond completed in 2010, if one took the yield on the 2016 sterling denominated bond outstanding at that point in time, one would derive a cost of 4.99% "*including actual average cross-currency swap costs incurred across Heathrow's non-sterling bond portfolio*" compared to 4.26% suggested by BA. The reduction in cost of HAL's embedded debt is then only 16 basis points and not 37 basis points estimated by BA.
- 4.2.14 HAL separately raises its own issue about the exclusion of non-sterling debt from the cost of debt. HAL considered that the CAA took the theoretical position that if sterling debt costs were lower than non-sterling (plus hedging costs), then HAL would raise slightly more debt in sterling markets until the costs equalised. HAL considered that this ignored the fact that diversification across sterling and non-sterling markets not only sought to minimise costs but also provide financial resilience. HAL considered that borrowing in non-sterling markets, at the margin, would be more expensive than borrowing in sterling markets, but was nevertheless an optimal business decision. HAL estimated that taking account of non-sterling debt hedging costs would add 3 basis points to the WACC¹⁹.

The CAA's response in the Section 15(1) Notice

- 4.2.15 The CAA has not engaged with this argument in the Section 15(1) Notice or Section 15(1) Technical Appendix. The CAA's response to all the points raised by all parties on all elements of the cost of debt (apart from inflation issues) was limited to the following:
- (a) A comment that airlines had raised various arguments pointing to a lower cost of debt and HAL had raised arguments pointing towards a higher cost of debt (paragraphs 5.18 and 5.27 of CAA, *ibid*); and
 - (b) A new cross-check between HAL's cost of debt and the cost of debt accepted by the CC for NIE in the *NIE provisional determination*.

My assessment

- 4.2.16 BA and HAL agree that the CAA and PwC's exclusion of the shorter maturity non-sterling debt has the effect of lengthening the average tenor of HAL's bonds considered by them and increasing the estimated cost of embedded debt, given the positive relation between tenor and YTM. The only difference between them is in how to correct for the distortion. BA estimates that correcting it will reduce the cost of embedded debt by 37 basis points whereas HAL estimates that it will only reduce the cost of embedded debt by 16 basis points.
- 4.2.17 Before I discuss the difference between BA and HAL in their response to this issue, I should clarify that I agree with both that the CAA has committed an error in entirely excluding non-sterling debt without making any sort of adjustment to the sterling debt that it takes into account.

¹⁹ HAL's view is stated in HAL's Response to CAA's Final Proposals, Chapter 1 WACC, November 2013, p24. The CAA re-states this view in its Section 15(1) Notice, paragraph 5.18

- 4.2.18 The CAA's approach relies on an assumption that HAL would have incurred the same average costs of embedded debt for its sterling debt if it had issued all its debt in sterling rather than the sub-set of debt that it actually issued in sterling. This assumption is wrong because the non-sterling debt issued by HAL was of a much shorter average tenor than that which HAL issued in sterling. The weighted average tenor of the sterling debt was 17.44 years whereas the weighted average of the non-sterling debt was 7.96 years.²⁰ If non-sterling debt had been taken into account, the average tenor of the overall portfolio would have fallen to 14.2 years.²¹ All else being equal, longer tenor debt is more expensive. By failing to take account of roughly a third of HAL's debt that was of much shorter tenor PwC and the CAA have inadvertently calculated a higher average cost of debt than HAL actually faces.
- 4.2.19 When it comes to correcting for the error, I agree that HAL's methodology has the virtue of simplicity and is likely to avoid any estimation error associated with the regression methodology. However, the strong explanatory power of the regression models reported by BA despite the small sample of data points on which they are based minimises the concern about estimation error. Further, comparing just one non-sterling bond with a sterling bond of similar maturity raises two concerns: availability of such proxies and the reliance on just one data point increasing the vulnerability to distortions in yield estimates caused by illiquidity, non-trading etc. The regression approach, albeit based on a small sample of data points, is a more robust approach.
- 4.2.20 The two methods generate substantially different estimates of the impact of adjusting for non-sterling bonds' shorter maturity: 37 basis points by BA vs 16 basis points by HAL.
- 4.2.21 HAL's illustrative example of the six-year Euro bond issued in 2010 seems to provide a clue to this discrepancy. HAL's estimate of the YTM for this bond is 4.99% inclusive of hedging costs against BA's estimate of 4.26%, which, I am told by BA, should also be considered inclusive of hedging costs since it is based on an attempt to derive a cost for a sterling-equivalent bond.
- 4.2.22 The actual YTM of this Euro bond is 4.13% (Table on p26, *ibid*). The difference between this yield and its sterling equivalent bond yield is a measure of the swap / hedging cost.
- 4.2.23 Based on BA's estimate the hedging cost i.e. 4.26% minus 4.13% is 13 basis points which seems reasonable and consistent with the estimates of hedging costs mentioned elsewhere. HAL itself indicates that adding currency hedging costs would add (only) 5 basis points to the cost of debt.²² Taking account of the fact that HAL's non-sterling debt accounts for approximately one third of its total debt, this would appear to imply currency hedging costs of approximately 15bps on any particular non-sterling issue.

²⁰ These figures are taken from pages 25 and 26 of Technical Appendix B to BA's Response to the Final Proposals and are based on using the tenors of the bonds when originally issued, ignoring the re-financing in 2008. I consider the method adopted by BA to be appropriate.

²¹ I have calculated this by multiplying the average tenor in each case by the aggregate value of the relevant debt calculated from BA's tables, adding both figures together and then dividing by the aggregate value of the sterling and non-sterling debt together; i.e. $((17.44 \times £6246) + (7.96 \times £3230.9)) / (£6246 + £3230.9)$.

²² In its response to CAA's FP, HAL says that, rather than simply excluding non-sterling debt, PwC should have included it and also the associated currency hedging costs. It adds: "we further estimate taking account of non-sterling debt hedging costs would add 5bps to the cost of debt or 3bps to the WACC" (HAL's Response to CAA's FP, chapter 1 WACC, November 2013, p24).

- 4.2.24 Based on HAL's estimate the hedging cost i.e. 4.99 minus 4.13% is 86 basis points which seems rather high.
- 4.2.25 While this is a rough test of the reliability of the estimates resulting from the two methodologies, it seems that BA's estimate is closer to the formula that the sterling equivalent cost of a bond is the foreign currency cost plus / minus the hedging cost.
- 4.2.26 While this formula is a mechanistic way of calculating the sterling cost of a foreign currency bond it does not mean that a sterling bond of a similar size and maturity will at all times have the cost dictated by this formula. A foreign currency bond and a sterling bond of the same size and maturity can have differing YTM's even after allowing for the hedging costs.
- 4.2.27 This possibility is admitted by PwC in the quote above i.e. HAL can lower its borrowing costs by issuing non-sterling bonds. This is one of the motivations for corporate treasurers resorting to foreign currency borrowing and swapping the debt into sterling. Indeed, HAL has said explicitly that the "*additional transaction costs of foreign currency bond issuing are more than offset by the cheaper funding that is available*".²³ HAL contends that the sterling market is not sufficiently large to cover all its borrowing needs. Even if this were true, HAL might still gain a benefit from being able to choose where to offer shorter and longer tenor bonds respectively.
- 4.2.28 The assumption made by both PwC and CAA that sterling bond costs can proxy for foreign currency bond costs after adjusting for the swap costs is only tenable when the currency markets are integrated and arbitrage eliminates the interest differentials between currencies.
- 4.2.29 In practice the currency markets are not fully integrated and arbitrage has its limitations. As noted by Professor Alan Shapiro, one of the best known authorities on international corporate finance:

“Swaps provide real economic benefits to both parties only if a barrier exists to prevent arbitrage from functioning fully. Such impediments may include legal restrictions on spot and forward foreign exchange transactions, different perceptions by investors of risk and creditworthiness of the two parties, appeal or acceptability of one borrower to a certain class of investors, tax differentials, and so forth” (A. Shapiro, *Multinational Financial Management*, 10th edition, 2013, Wiley, p324).

- 4.2.30 In efficient international currency markets, financial arbitrage may eliminate cost saving opportunities in interest rate and currency swaps “associated with a mispricing of credit quality”. Professor Shapiro, however, says:

“Despite this efficient markets view, many players in swap markets believe that such anomalies in perceived credit risk continue to exist. The explosive growth in the swaps market supports this belief. It may also indicate the presence of other factors such as differences in information and risk aversion of lenders across markets, that are likely to persist” (p315, *ibid*).

²³ Page 22, HAL's Response to the Initial Proposals.

- 4.2.31 It is therefore a reasonable presumption that corporates when engaging in foreign currency borrowing accompanied by swaps seek to exploit the cost advantage of doing so over the cost of borrowing in their home currency. It follows that the assumption made by PwC and the CAA that sterling bond costs to HAL can proxy for the cost of its foreign currency debt is rather facile.
- 4.2.32 It is therefore more appropriate that the costs of foreign currency debt are directly factored into the cost of HAL's embedded debt.
- 4.2.33 In the case of HAL, PwC and the CAA accept that because of its large funding requirements HAL has to resort to issuing foreign currency bonds as the sterling credit markets are not large enough to fully fund these requirements. This is a plausible scenario but it merely confirms that HAL faces constraints in the sterling bond market i.e. credit rationing, a characteristic of an inefficient market at least so far as HAL is concerned.
- 4.2.34 If the sterling bond market is limited in size for HAL, it is wrong to use only sterling-based bond costs for benchmarking since the size limit implies that such costs are unlikely to be same as the cost of non-sterling bonds, thus nullifying the assumption that sterling bond costs are a reliable proxy for non-sterling bond costs.
- 4.2.35 Overall, I consider that the CAA erred in not explicitly taking into account the lower cost of non-sterling bonds issued by HAL, thereby inflating the cost of its embedded debt. The CAA's assumption that HAL's sterling bond costs are a reasonable proxy for HAL's non-sterling bond costs is of doubtful validity not only because of the substantial differences in maturities between sterling and non-sterling bonds of HAL but also because the assumption of efficient currency and interest rate markets which seems to underpin the assumed parity between sterling and non-sterling bond costs (after adjusting for swap costs) is unlikely to hold true.
- 4.2.36 I consider that the CAA erred in not taking account of the differing maturities of sterling and non-sterling bonds in its estimation of the cost of HAL's embedded debt.
- 4.2.37 BA's estimation of the error i.e. 37 basis points seems to be a more reasonable estimate than the 16 basis points estimate made by HAL for the reasons set out above.

4.3 HAL's actual bonds: did the CAA err when it chose not to exclude subordinated debt issued by HAL with a credit rating of BBB or BB?

- 4.3.1 BA identifies two BB and three BBB rated bonds considered by PwC in its estimation of the cost of HAL's embedded debt (see PwC Report, October 2013, Appendix 2 and BA's Response to CAA's FP, Annex B, p19). These carried the YTM at issuance of 7.13% and 5.38% (the two BB rated bonds) and of 6.37%, 7.32% and 6.11% (the three BBB rated bonds).

- 4.3.2 I am informed by BA that the two BB bonds were issued by Heathrow Finance plc ("HFP"), a holding company that owns Heathrow Funding Limited ("HFL"). The three BBB bonds, were issued by HFL and the bonds issued by HFP are subordinate to those issued by HFL. The three BBB bonds rank subordinate to the A- bonds that are also issued by HFL.
- 4.3.3 BA estimates that the two subordinated bonds with BB rating have an average spread over HAL's senior bonds (issued by HFL) of 326 basis points (averaged over the period from 2 November 2010²⁴ to 17 October 2013²⁵); BA estimates that the three subordinated bonds with BBB rating have an average spread over HAL's senior bonds (issued by HFL) of 112 basis points (averaged over the period from 3 September 2010²⁶ to 17 October 2013²⁷).²⁸
- 4.3.4 BA calculated that subtracting these spreads from the issuance YTM of the five BB and BBB bonds reduces the CAA's estimate of HAL's embedded debt cost in its Final Proposals ("FP") by 55 basis points from 3.3% to 2.75% (pp22-23, Annex B, BA's Response to CAA's FP, November 2013).
- 4.3.5 In its estimation of the cost of HAL's embedded debt, PwC carried out a sensitivity analysis by removing the two BB rated bonds (PwC Report, October 2013, Appendix2, Table A2.2, p106). It reported the weighted average nominal cost of embedded debt at 6.26% (the same as with the bonds included) and the simple average cost of 6.33% (0.01% higher than with the bonds included).
- 4.3.6 PwC concluded that "*removing the sub-investment grade issuances from the sample of HAL bonds does not materially impact the cost of embedded debt*" (p106). It did not consider the impact of removing the three BBB rated bonds. Nor did it take account of the different tenors of the various bonds in considering the average costs.

BA's arguments against inclusion of BBB and BB rated debt

- 4.3.7 BA argues that in calculating the cost of embedded debt, the CAA should not have taken into account HAL's bonds rated BBB and below because HAL has actually maintained a much higher credit rating despite being more highly geared than the target gearing of a notional, efficiently financed airport and despite the much greater capital investment and economic turbulence in Q5 than expected in Q6. HAL has achieved the target gearing of 60% by issuing only lower cost A- bonds. Indeed, its A- rated debt on its own raises HAL's gearing to 67%, well above the CAA's target gearing level for the company.
- 4.3.8 HAL has resorted to the issue of BBB and BB rated bonds so as to raise its gearing level as high as 82%, well above the target.
- 4.3.9 The CAA should therefore consider only the cost of A- rated bonds in estimating the cost of new debt (BA's Response to the CAA FP, Building Block – WACC, p13).

24 The date of issue of the first BB rated bond.

25 i.e. shortly before BA submitted its response to the Final Proposals.

26 The date of issue of the first BBB rated bond.

27 i.e. shortly before BA submitted its response to the Final Proposals.

28 See fn 32, Annex B, BA's Response to the CAA's FP, November 2013.

- 4.3.10 As regards the difference in the positions of BA and PwC, BA considers that this arises from two factors:
- PwC only looked at removing the BB rated bonds and not the BBB rated bonds; and, more importantly
 - PwC did not take account of the differing tenors of the bonds. As such, it made a flawed comparison between the cost of the BB bonds and the cost of the senior debt. The BB bonds were actually of much shorter tenor than the average (and the same is true of the BBB bonds). Shorter tenor bonds are cheaper. It is for this reason that BA does not propose to just remove the subordinated debt without more. It proposes either that the BB/BBB debt be effectively "re-rated" to derive a cost as if it were A- rated debt or, alternatively, that some form of adjustment be made to the average tenor of the portfolio after removal of the subordinated debt.

HAL's response

- 4.3.11 HAL makes the following points (HAL's Response to BA's Response to CAA FP, p9):
- The CAA/ PwC have ignored the subordinated debt tranches having assessed that their average coupon was in line with average senior debt coupon, albeit they had a shorter tenor;
 - This is an appropriate approach as subordinated debt is part of the actual capital structure where leverage exceeds the notional capital structure;
 - The methodology adopted by BA to adjust for the high cost of subordinated debt is inappropriate. Embedded debt costs are based on cost at issuance whilst BA uses the average subordinated debt premia over the last three years;
 - The average yield premium of the two subordinated bonds relative to the HFL senior debt is 270 basis points and not 326 basis points estimated by BA.
- 4.3.12 HAL additionally argues that the "*CAA explicitly targets a rating based on the notional capital structure more at the BBB+/ BBB level*". Further, it argues that its ability to issue A-rated bonds is attributable to its 'whole business securitisation' (WBS) financing model and that airlines have benefited from the low cost financing that HAL has achieved (HAL's comments on BA's response to CAA's Final Proposal, November 2013, p6 and p11).

The CAA's response in the Section 15(1) Notice

- 4.3.13 As already noted above, the CAA has not engaged with the specific arguments on cost of debt advanced by BA (or any other party) in the Section 15(1) Notice or Section 15(1) Technical Appendix. The CAA's response has simply been to note that arguments have been raised in both directions and to make a comparison with the cost of debt provisionally determined for NIE by the CC.

4.3.14 However, in response to BA's contention that for HAL, the CAA should assume a rating of A- at gearing of 60%, the CAA argues that while HAL might be able to achieve a higher rating than the CAA has assumed, "HAL's actual financing includes credit enhancements including security over assets and cross-guarantees" (The CAA, paragraph 5.52, *ibid*).

My assessment

- 4.3.15 BA's arguments and HAL's counter-arguments centre on the concept of a regulated entity that finances itself efficiently with the 'right' mix of debt and equity. A regulator like the CAA has to take a view as to what such a mix of debt and equity is for an efficiently financed regulated entity. This view needs to strike a balance between the benefit of high leverage which lowers the cost of capital because of the lower cost of debt than equity and the high risk of leverage causing financial distress to the entity to the detriment of airlines and passengers.
- 4.3.16 In the UK, many regulators have generally targeted an investment grade rating of BBB or BBB-, the lowest investment grade rating, as the minimum rating the regulated entity should maintain for its debt issues.
- 4.3.17 The CAA's key assumption in determining the appropriate level of gearing i.e. the right debt / equity mix, in the estimation of WACC is that "*HAL should be able to obtain and maintain a solid (sometimes known as 'comfortable') investment grade rating at an assumed gearing level of 60%. A solid investment grade rating is interpreted as in the region of BBB/ BBB+. The aim of financeability assessment is for HAL to be in a position to absorb reasonable, unanticipated downside risk and still retain an investment grade credit rating*" (CAA's FP, ch.10, para 10.23, October 2013).
- 4.3.18 Many of the building blocks of the price control imposed by the regulator in a control period such as opex and capex allowances, efficiency targets and cost of capital allowances are designed to ensure that the regulated entity is able to meet the financial metrics that credit rating agencies employ in assessing the creditworthiness of the entity and in awarding a particular investment grade rating (*the financeability test*). These allowances are often relaxed to allow the entity to meet the financial metrics required to qualify for the minimum investment grade rating that the regulator set as the target i.e. BBB/BBB+ in the case of HAL.
- 4.3.19 The definition of target gearing and target investment grade rating at that gearing level described above leads to the presumption that all of the regulated entity's debt financing up to the target gearing level can be at the minimum investment grade rating of BBB although it is reasonable to expect that the firm's first debt issues may command a higher rating. It follows that a regulated entity is expected to reach the target rating of BBB/ BBB+ while reaching the target gearing of 60%. This will normally be reflected in the entity having a portfolio of bonds some with higher than the target rating, some with the target rating but none with a rating below the target rating.

- 4.3.20 An important question is how the cost of debt and hence the WACC will be measured if the regulated entity can attain the target gearing of 60% at much higher rated debt, say A-, rather than BBB i.e. at a lower cost than the cost of BBB rated debt. If the regulated entity stopped all debt financing at the A- rating level having hit the target gearing, the answer would ordinarily be that only the cost of the higher rated debt will need to be taken into account. I note that if the higher rating was only achieved because the regulated entity out-performed the notionally efficient entity then there would be a case for giving the regulated entity the benefit of that out-performance. In the present case, the only argument that HAL has advanced in this respect is an argument that the higher rating results from its use of whole business securitisation. The CAA has also argued that the higher rating is due to 'credit enhancements' and not superior efficiency. I discuss this further below.
- 4.3.21 If having hit the target gearing with higher rated debt, the entity chooses to borrow more and gears up above 60% with lower rated debt, should the regulator include the higher cost of the lower rated debt in the cost of debt allowance? A relevant related question is who benefits from this higher gearing financed with lower rated debt. Do the customers of the entity or the owners of the entity benefit from this higher gearing?
- 4.3.22 Once the entity achieves the target gearing with higher rated debt, any further increase in gearing using more expensive and lower rated debt is not to the benefit of the entity's customers. Indeed by increasing the financial risk to the entity's operations and the risk of financial distress, such increase in gearing beyond the target gearing causes detriment to the customers. If the regulator includes the cost of the lower rated debt in its cost of capital allowance it amounts to providing an incentive to the entity to gear up to imprudent levels.
- 4.3.23 An increase in gearing above the target level is clearly to the benefit of the entity's owners since it allows them to reduce their equity stake. Thus owners benefit at the expense of the customers.
- 4.3.24 The CAA's position as regards the notional versus actual gearing is that "caution still needs to be applied when using the actual bonds. Compared to the CAA's notionally financed airport operators. HAL and GAL have more complex financial arrangement with security and other credit enhancements and achieve a higher level of gearing. HAL's actual gearing is around 78% and this would suggest that at notional gearing of 60% the cost of debt might be lower for the notionally financed airport operator than HAL's actual bonds suggest" (The CAA's FP, Technical Appendix, October 2013, para 6.47). What this statement implies is that cost of debt might be lower because the airport would have issued more of higher rated debt and less of lower rated debt at the notional gearing level.
- 4.3.25 It logically follows that the CAA should disregard the cost of any debt incurred to achieve a higher gearing than the notional gearing. It is also logical that the only relevant cost is the cost of debt that allows the entity to reach the target gearing. If such debt were issued at A-rating then the relevant cost is the cost of A- rated debt alone. The CAA should therefore logically disregard the cost of lower rated debt above the notional gearing level even if such lower rated debt satisfies the CAA's target rating of BBB/ BBB+.

- 4.3.26 The CAA makes a distinction between the cost of debt of an efficiently financed airport operating at the target gearing while maintaining solid investment grade for its debt and the cost of debt of the entity at its actual level of gearing above the target level. If cost of debt allowance is based on the latter, it amounts to 'pass-through' of the actual cost rather than the cost of a notional, efficiently financed entity. It is the CAA's position that it will not 'pass through' the actual cost of debt of the entity but only the cost of debt at the notional gearing level of a notional, efficiently financed entity (The CAA's FP, Technical Appendix, October 2013, para 6.45 and Section 15(1) Technical Appendix, para 5.36). This policy reflects the principle that regulation should seek to achieve the outcome of a competitive market and that the regulator should therefore look to the position of a notionally efficient operator rather than be bound by the potentially inefficient performance of the regulated entity itself. This is, of course, reflected throughout the whole of the CAA's reasoning in its Section 15(1) Notice and not only in the WACC reasoning.
- 4.3.27 In the case of HAL, it is clear that HAL has been able to comfortably maintain A- rated debt at the target gearing level of 60%. The considerable level of comfort is indicated by the fact that HAL has been able to raise its gearing to 67% and still maintain its debt rating at A-. Thus the only cost that should be passed on to HAL's customers should be the cost of its A-rated debt.
- 4.3.28 To include the cost of lower grade debt that HAL has raised to gear up further - up to 78% or even 82% - which is a choice that HAL has made, in the cost of debt allowance for Q6 will thus amount to passing through the actual debt cost, which is inconsistent with CAA policy and contrary to the accepted principles of regulation (as discussed above).
- 4.3.29 The fact that HAL can efficiently finance itself to the target gearing with only A- rated debt shows that it has considerable headroom in meeting the financeability criteria set by rating agencies. It points to the fundamentally strong financial position of HAL, a fact noted by rating agencies.
- 4.3.30 Gearing-up beyond the target gearing level set by the CAA, is a matter of choice made by HAL and gearing up to a very high level using lower rated debt is again a matter of choice made by HAL. The airline customers of HAL should not bear the cost of lower-rated debt that is a consequence of the deliberate policy choices made by HAL. Such debt represents the actual debt of the entity and not the notional debt of an efficiently financed entity as per the CAA's definition.
- 4.3.31 Turning now to HAL's argument that its ability to issue A rated debt up to the level of the target gearing and even beyond is due to whole business securitisation ("WBS"), HAL has not demonstrated that, absent such WBS, HAL would be in danger of a rating downgrade to such an extent that it cannot reach the target gearing of 60% without issuing debt rated lower than A-. It is arguable that its ability is a function of the fundamental soundness of its business and its financial strength.

- 4.3.32 Indeed the fundamental soundness of the Heathrow business is noted by the CAA which says: “Compared to other airports, Heathrow would appear to have a very strong position from a credit perspective. Heathrow is the world’s busiest airport and one of Europe’s main hubs for full service airlines. It has a very strong market position owing to excess demand and has a favourable location near London, good transport links and attractive catchment area. Heathrow is the hub airport for BA, which is a member of oneworld, one of the world’s three global airline alliances. Heathrow has also proven more resilient to economic slowdowns than other major UK airports” (CAA’s FP, ch.10, para 10.25, October 2013).
- 4.3.33 The CAA’s view mirrors the views of the credit rating agencies with Standard & Poors characterising Heathrow’s business risk as ‘excellent’²⁹.
- 4.3.34 These views confirm that HAL’s ability to issue substantial amounts of A- rated debt to the extent of 67% gearing, comfortably in excess of the target 60%, is due less to financial engineering such as WBS than to the fundamental business and financial strength of Heathrow, such strength being due more to HAL’s market power than to any superior efficiency of its performance.
- 4.3.35 As regards the CAA’s view that HAL was able to issue A- debt well above the notional gearing due to ‘credit enhancements including security over assets and cross-guarantees’ (see paragraph 4.3.14 above), I consider this is, at best, an untested hypothesis. The CAA has not provided any evidence to show that, absent such credit enhancements, HAL would not have achieved A- rating for its debt to reach the notional gearing of 60%.
- 4.3.36 In contrast to this untested hypothesis is the proposition that HAL was able to do so on the strength of its business fundamentals, for which there is strong evidence as noted in the previous paragraphs.
- 4.3.37 While it might conceivably be true, as HAL has argued, that airlines might have benefited from HAL’s ability to issue low cost higher rated debt (though I have seen no proof of this), it is also true, as the quote from the CAA above testifies, that HAL has benefited from the strong profile of its major customers such as BA. The airport and the airlines have a symbiotic relationship adding to each other’s fundamental strengths.
- 4.3.38 The ability of HAL to raise its gearing level to 67% with just A- rated debt, comfortably above the target of 60%, raises intriguing questions about the tightness of the allowances that the CAA has made not only in the cost of capital area but also in other areas such as opex and capex and in setting target efficiency criteria for HAL. However, it is outside my brief in this expert opinion to comment on these questions.
- 4.3.39 Since in my opinion it is incorrect to include debt rated lower than A- which takes HAL's gearing well above its notional gearing, I consider that the CAA has overstated the cost of HAL’s embedded debt by including the subordinated debt.

29 Cited by BA in BA’s Response to CAA’s FP, ‘Building Block – WACC’, p37.

- 4.3.40 HAL argues that PwC and the CAA have ‘ignored’ the subordinated debt anyway and so it implies that they have not overestimated the cost of embedded debt.
- 4.3.41 However, PwC said only that “removing the subinvestment grade debt [by which it means only the two BB rated bonds] from the sample of HAL bonds does not materially impact the cost of embedded debt” (PwC Report, October 2013, p106).
- 4.3.42 I infer from PwC’s statement that the bonds it considered in estimating HAL’s embedded debt cost did include (all) the subordinated debt. It merely took the view that removing them would not make a material difference.
- 4.3.43 However, BA calculates that removal of the subordinated debt would reduce the CAA’s estimated cost of embedded debt by 55 basis points, from 3.3%, a 17% reduction. This is a very significant reduction and certainly material at the level of the cost of embedded debt.
- 4.3.44 HAL provides an alternative estimate of the excess cost based on a spread of 270 basis points at issuance between BB and A- rated debt (rather than BA’s 326 basis points averaged over three years) (see paragraph 4.3.11 above).
- 4.3.45 PwC found there to be no impact from removing the subordinated debt but I agree with BA that this was because it only removed the two BB bonds and because it took no account of the shorter tenor of the BB and BBB bonds. The shorter tenor of the BB and BBB bonds masks the fact that their cost is higher due to their lower credit-ratings.
- 4.3.46 As between the alternative forms of correcting for the error proposed by HAL and BA respectively, my view is that HAL has a valid point since the cost of embedded debt is based on YTM at issuance and the impact of removing the subordinated debt should be measured on the same basis i.e. on the spread at issuance.
- 4.3.47 On the basis of HAL’s estimate, the cost of embedded debt would be reduced by 46 basis points to 2.84% rather than by 55 basis points to 2.75%. Compared to the cost of 3.3% in the CAA’s FP, HAL’s estimate represents a reduction of 14%, still a large reduction in the cost of embedded debt. I note that this also does not take account of the spread between BBB and A- rated debt. I do not currently have any figures for the spread between BBB and A- rated debt based on YTM at issuance.
- 4.3.48 As regards HAL’s argument that it is appropriate to include subordinated debt when it takes HAL’s gearing above the notional gearing, I set out above (in paragraphs 4.3.15 to 4.3.40) my opinion as to why it is inappropriate to do so.
- 4.3.49 Overall, I consider that the CAA is wrong to include the subordinated debt issued by HAL and that it has thereby significantly overstated the cost of HAL’s embedded debt as measured by its actual bonds.

4.4 HAL's actual bonds: did the CAA err in failing to exclude re-financing incentives?

- 4.4.1 It is widely accepted that in August 2008 BAA re-financed its operations by issuing new bonds to replace some of the old bonds.

- 4.4.2 Six new bonds were issued and BA identifies the increase in coupons for the new issues relative to those attached to the bonds they replaced, ranging from 10 to 70 basis points (see p24, Annex B, BA's Response to CAA's FP). The question is whether this increase in coupon should be taken into account in calculating the cost of embedded debt. It has been so taken into account by the CAA.

BA's arguments against inclusion of re-financing incentives

- 4.4.3 BA argues that the "re-financings were completed with higher coupons almost certainly to incentivise bondholders to migrate onto the new complex leveraged financing structure created as a consequence of the change in ownership of the airport" (p24, Annex B, BA's Response to CAA's FP).
- 4.4.4 BA also argues that the motive behind the refinancing with additional incentives to existing bondholders to migrate was to enable BAA/ HAL to overcome the restrictive covenants attached to the old bonds. These restrictions were protective of bondholder interests against dividend distributions and higher leverage.
- 4.4.5 Dilution of the restrictive covenants would allow the airport's owners to release equity and facilitate dividend payments with both having the effect of returning equity to the owners.
- 4.4.6 BA argues that such transactions designed to further the airports owners' interests were not relevant to the calculation of the cost of debt for a notional efficiently financed airport.
- 4.4.7 BA estimated that taking the incentive elements i.e. the increase in coupons between 10 and 70 basis points on the re-issued bonds would reduce the cost of HAL's embedded debt by 17 basis points (see p25, Annex B, BA's Response to CAA's FP for details).

HAL's response

- 4.4.8 HAL acknowledges the uplift in spreads of either 10 basis points or 70 basis points to the 'legacy' bonds (HAL's Response to BA's Response to CAA's FP, pp8-9).
- 4.4.9 It argues that the uplift was needed to compensate bond holders for bearing greater risk following changes to the business composition of BAA which had issued the legacy bonds.
- 4.4.10 At the time of issue of the original bonds, BAA was a well-diversified business enjoying a credit rating of AA-/ A+ but "by the time of the re-financing, all the non-UK assets of BAA plc had been or were being sold and it was also known that Gatwick and Stansted were highly likely to be sold" substantially narrowing Heathrow's business profile.
- 4.4.11 HAL with a credit rating of A- at the notional gearing of 60% experienced a 3 notch downgrade compared to the rating that BAA had enjoyed. The 70 basis points uplift therefore represented a reasonable 25 basis points incentive to bondholders for the enhanced risk exposure.

- 4.4.12 HAL rebuts the ‘implication’ in BA’s arguments that the “2008 refinancing was a quick route to paying dividends” and argues that “it is public that the refinancing specifically prohibited dividends until over £3bn in loans had been repaid that would clearly take say 2 years to occur”.

The CAA's response in the Section 15(1) Notice

- 4.4.13 As already noted above, the CAA has not directly engaged with the specific arguments on cost of debt advanced by BA (or any other party) in the Section 15(1) Notice or Section 15(1) Technical Appendix.
- 4.4.14 In response to BA’s argument about overestimation of HAL’s cost of embedded debt due to inclusion of re-financing incentives, the CAA says that “PwC compared HAL and GAL bonds to benchmark indices and concluded that the airports’ bonds were issued at yields to maturity that were less than the benchmark indices” (paragraph 5.53, *ibid*). The CAA implies that even though the re-financing uplifts to coupons were included in the cost of HAL’s actual debt it nevertheless was below the cost based on benchmark indices and that its determination was guided only by the latter. So in effect the re-financing argument is irrelevant.

My assessment

- 4.4.15 I agree with BA that the CAA erred in ignoring the uplift in coupons to the legacy bonds and in not correcting for it in estimating the cost of HAL’s embedded debt.
- 4.4.16 BA attributes the uplift to the capital structure and ownership changes and the need to incentivise legacy bondholders to migrate to new bonds with less restrictive covenants whereas HAL attributes it to the need to compensate legacy bondholders for bearing greater risk following changes to the business profile of BAA including the likelihood of the sale of Gatwick and Stansted.
- 4.4.17 BA argues that capital structure or ownership changes of the airport owners and the attendant costs of achieving those changes are not relevant to the determination of the cost of debt of a notional, efficiently financed airport. HAL is reticent about the link to ownership changes.
- 4.4.18 If BA’s argument is valid, it is equally valid to argue that changes to the business profile of the holding company of the airport and the consequent re-rating of its debt in the credit markets is not a relevant consideration since these changes did not affect the regulated airport’s operations.
- 4.4.19 I find HAL’s argument that the rating downgrade was also due to the likely sale of Gatwick and Stansted untenable. The CC’s market inquiry in 2008 was far from completion and any expectation at the time of the re-financing in August 2008 that the CC would order the sale of either or both of the airports was at best speculative. Such an order might also have been subject to appeal which would have prolonged the time to sale and increased the uncertainty about their eventual sale.

- 4.4.20 While it is true that the covenants attached to the new bonds specifically prohibited dividends until over £3bn of loans had been paid off and that it might have taken two years for HAL to achieve that target, the new covenants nevertheless were far less restrictive than the ones they replaced³⁰.
- 4.4.21 Certainly HAL would have had wait two ‘long’ years to enjoy the freedom that the new covenants provided but this was better than not having any freedom at all or having far less under the old covenants.
- 4.4.22 Finally, I note that the refinancing took place while the CC’s price control review was still in progress. In determining BAA’s embedded cost of debt, the CC was aware of the refinancing and the uplift to the legacy coupons of 10 to 70 basis points. However, it chose to disregard the uplift in computing BAA’s cost of embedded debt.
- 4.4.23 The CC observed as follows: “In August 2008 BAA migrated BAA’s existing bonds into a new financial structure. In order to secure bondholder’s approval for this refinancing, BAA offered the incentive of an additional 10 to 70 basis points on the coupon its bonds pay. We have not included this step up in our calculations on the grounds that it is a cost related solely to ADI’s acquisition of the company and therefore one which shareholders alone should bear”. (Competition Commission, Stansted Airport Limited Q5 price control review, October 2008, Table 4, p676).
- 4.4.24 It is clear from the CC’s observations that it did not give credence to the view, now put forward by HAL (see paragraph 4.4.11 above), that the uplift was a compensation for the additional risk borne by the BAA’s migrating bond holders.
- 4.4.25 HAL’s argument that the uplift should not be disallowed because it is ‘reasonable’ in size is only valid if the underlying rationale for allowing it is valid.
- 4.4.26 My view is that the CAA calculated HAL’s actual cost of embedded debt wrongly by not stripping out the incentive elements that were designed to serve the interests of the owners and not the customers of HAL. It would not have been computationally difficult to strip out the incentive elements and it should have been done.
- 4.4.27 As regards the CAA’s contention that the re-financing uplifts were irrelevant because it was relying first and foremost on the benchmark indices (see paragraph 4.4.14 above), it is to be noted that I conclude below that the figures derived from the benchmark indices were also overstated. The CAA has therefore, in effect, compared two overstated figures.

³⁰ The 2016, 2021, 2028 and 2031 maturity bonds (which had a 70 basis point incentive premium) according to BAA 2007 accounts had: Net Borrowings/Adj. Capital 1.75x; Secured Borrowings/Adj. Capital 0.5x; Interest Cover Ratio 2.0x. definition of Borrowings was broad including guarantees of ADI debt. Post refinancing equivalent bonds (according to 2008 major prospectus) had: Regulatory Asset Ratio 70%; Interest Cover Ratio 1.40x. A dividend will affect Adj. Capital but not Regulatory Asset Ratio. The definition of net borrowings in the pre-acquisition BAA debt included consolidated group debt – restricting total indebtedness. Post-acquisition split into senior and junior debt restricts only debt that ranks pari passu or senior allowing HAL to lever up beyond the 60% Regulatory Asst Ratio of the notional airport. These changes to the previous covenants make feasible payment of higher dividends and return of equity to owners. I am relying on BA for the accuracy of this information, which they have provided to me at my request.

- 4.4.28 In any event, though, the whole point of using two different reference points for deriving the cost of embedded debt is that the figure derived from one source should corroborate and support the figure derived from the other source. If there were a big difference between the figures, a regulator would need to investigate to understand why that difference exists. In particular, it would need to consider whether the benchmark indices it was using were fit for the intended purpose.
- 4.4.29 Both BA and HAL agree on the size of the uplift to the coupons of the legacy bonds.
- 4.4.30 It is my opinion that the refinancing was in the airport owners' interest and was irrelevant to the operations of the regulated airport. Therefore the uplift is a cost that must be borne by the owners of HAL and not by its customers. It should therefore be removed from the cost of embedded debt.
- 4.4.31 BA calculates that the uplift adds 17 basis points to the cost of embedded debt estimated by CAA. I have reviewed the basis for this calculation and agree with the method adopted and consider the arithmetic to be accurate. This cost should therefore be reduced by 17 basis points.³¹

4.5 Benchmark indices: did the CAA err in using benchmark indices including bonds issued by financial institutions?

- 4.5.1 As a starting point to estimating the appropriate cost of debt for Q6, the CAA evaluates whether the Q5 settlement of cost of debt, i.e. 3.4%, was fair and did not overcompensate the airports. Using the Bank of America-Merrill Lynch (hereafter BoAML) indices of A and BBB rated bonds (see Figure 6.3, p43, Technical Appendix to CAA FP, October 2013), it estimates that over the Q5 period, 1 April 2008 to 30 June 2013, the YTM to the index is 3.39% and concludes that the Q5 decision was broadly correct (para 6.36, Technical Appendix to CAA FP, October 2013).
- 4.5.2 The CAA also uses the same indices as a cross-check for the cost of embedded debt in Q6.
- 4.5.3 The question is whether it was appropriate for the CAA to use the BoAML indices (or any other indices including bonds issued by financial institutions) or whether it should have used indices that did not include the bonds of financial institutions.

BA's arguments against use of the BoAML indices

- 4.5.4 CEPA for BA argues that the CAA should not have used the BoAML indices (Annex B to BA's Response to CAA's FP, November 2013 – Building Block - WACC).

³¹ I note that BA does not make any adjustment for the refinancing incentive of 70 basis points applied to the £300m bond issued in 2008 with a YTM of 12.45%. This is because PwC did not take account of this bond in its calculations, on the basis that it was anomalous. Taking it into account would slightly increase the reduction to be made but I agree that it is appropriate not to take it into account.

- 4.5.5 It says that the global financial crisis that started in 2008-09 hit most financial institutions very hard and depleted their financial strength. The yields on bonds issued by such financial institutions and the trading in credit markets of those bonds have been distorted by the crisis unlike those of non-financial corporates, especially, those of regulated utility firms. Financial firms were rendered very weak by the financial crisis and therefore exposed to abnormally and massively high financing costs. The yields on their debt were abnormally high. Comparison of HAL bonds with the indices that include those of financial institutions is therefore inappropriate and leads to an unrealistic and artificially high yield benchmark for HAL.
- 4.5.6 BA has proposed that the iBoxx index that excludes financial firms is a more appropriate index for benchmarking HAL and GAL since it is free of the distortions that the BoAML index suffers from.
- 4.5.7 BA contends that the CAA's conclusion that the Q5 cost of debt was broadly correct would not be warranted if the CAA had used an undistorted index such as the iBoxx Sterling Non-gilt, Non-financial 10-15 year maturity A and BBB bond index. This index is free of the distortion caused by the abnormally high yields on similar bonds issued by financial firms and included in the BoAML index. It would therefore have been more comparable to the Credit Suisse Liquid Bonds (CSLB) used in Q5 and would satisfy the consistency principle.
- 4.5.8 BA estimates the benchmark yield on the iBoxx index in the Q5 period. The average YTM on this index during that period is 2.62%, considerably smaller than the 3.39% on the BoAML index and the Q5 determination of 3.4%. It is clear that, benchmarked against the more appropriate benchmark index, the Q5 determination was over-generous to the airport operator.
- 4.5.9 BA also contests the suitability of the BoAML index for the purpose of cross-checking the YTM estimated from traded bonds of HAL as a measure of the cost of the airport's embedded debt in Q6.

HAL's response

- 4.5.10 In its response to BA's comments on cost of debt detailed above, HAL says that "in assessing the cost of embedded debt for Q6 one should be taking index levels over the extended period of time (1996-2012) when existing bonds were issued, whilst for new debt the focus is simply on current yields (when spreads on financials have returned to corporate levels). We also note that when BA criticises the Q5 cost of debt relative to the BoAML index, it focuses on real costs and does not adjust for the fact that Q5's elevated inflation levels were not envisaged when the cost of debt was set" (HAL's Comments on Airlines' Responses to the CAA's Final Proposals, November 2013, chapter 1, p7).
- 4.5.11 HAL again argues that BA's concern about the inclusion of the financial firms' bonds is no longer justified since "spreads on financials have returned to corporate levels" (HAL's Comments on Airlines' Responses to the CAA's Final Proposals, November 2013, chapter 1, p7).

The CAA's response in the Section 15(1) Notice

- 4.5.12 As already noted above, the CAA has not directly engaged with the specific arguments on cost of debt advanced by BA (or any other party) in the Section 15(1) Notice or Section 15(1) Technical Appendix.
- 4.5.13 The CAA responds that comparison with the BoAML indices was “to provide background to the Q6 review and to refute the claim that airports had been under-rewarded during Q5” (paragraph 5.33, *ibid*). It does not respond to BA’s point about the inappropriateness of these indices for Q6 cost of embedded debt determination.

My assessment

- 4.5.14 It is useful to identify which benchmark indices have been used by the CC and CAA in Q5 and by the CAA and PwC for estimating the cost of debt for Q6:
- In Q5, the CC used the Reuters Datastream index of A and BBB bonds but it is not clear whether the index included those of financial firms; the CAA in its final determination used the Credit Suisse Liquid Bonds (CSLB) index which excluded financial firms;
 - In its April 2013 paper for the CAA, PwC used the BoAML index inclusive of financial firms and the CAA relied on the same index to assess whether the Q5 cost of debt of 3.4% was too generous;
 - In its October 2013 paper for the CAA, PwC does not clearly indicate which index it used but BA argues that since the data it reports in its October 2013 paper look similar to those used in its April 2013 paper, it is a fair inference that PwC continued to use the BoAML index for its October 2013 report and the CAA has relied on that index (see footnotes 18 and 24 to the Annex B to BA’s Response to CAA’s FP, “Building Block – WACC).
- 4.5.15 Neither PwC nor the CAA considers whether the BoAML index suffers from any distortion due to the inclusion of financial firms’ bonds and is therefore an inappropriate benchmark to use. It might have been appropriate to use that index if the same had been used by the CAA in its Q5 determination at least on grounds of consistency. However, as noted above, the CAA actually used the CSLB index in its determination. Neither PwC nor the CAA offers any discussion as to whether there are any material discrepancies between the CSLB and BoAML indices and whether switching from the former to the latter index for the purpose of benchmarking was likely to lead to invalid conclusions about the robustness of the Q5 determination.
- 4.5.16 This omission on the part of the CAA is particularly striking since its choice of the CSLB in Q5 was deliberately and consciously guided by the need to exclude bonds issued by financial firms.³²

32 (see fn 75, p124, at http://www.caa.co.uk/docs/5/ergdocs/heathrowgatwickdecision_mar08.pdf)

- 4.5.17 If an index was deemed by the CAA to be appropriate in Q5 because of its exclusion of financial firms' bonds, by the same logic, the BoAML index should be deemed inappropriate because of its inclusion of such bonds. The CAA, in switching from the CSLB in Q5 to BoAML in Q6 should have explained the rationale for the switch and explained whether the switch satisfied the principles of relevance and consistency. The CAA's failure to explain the rationale of its choice is surprising.
- 4.5.18 I consider that, in Q5, the CAA was right not to use any index that included the bonds of financial institutions as it would not have provided a properly representative view of the cost for a regulated airport of issuing debt in that period coinciding with the financial crisis. I consider that the CAA should have used the same approach in Q6 for embedded debt. I therefore consider that the CAA erred in using the BoAML index.
- 4.5.19 The CAA estimates the cost of embedded debt as the YTM at issuance of the HAL bonds. In the case of HAL many of its bonds were issued (or reissued) in 2008. Since the YTM of the BoAML index were elevated during this period for the reasons set out above, it does not provide a reliable benchmark for a notional efficiently financed airport and therefore does not provide a reliable cross-check on the traded bond yields.
- 4.5.20 A more appropriate index such as the iBoxx index provides a more reliable benchmark for the cost of embedded debt for Q6 since it excludes the financial institutions.
- 4.5.21 Thus the unreliability of the BoAML index whether as a benchmark to judge the correctness of the Q5 determination or as a cross-check on the cost of embedded debt for Q6 rests on its being contaminated by the inclusion of the financials. The arguments against its use for either purpose are the same.
- 4.5.22 Turning to HAL's arguments, it is not clear why one should examine the index levels over the extended period of time (1996-2012) when existing bonds were issued. HAL has not shown how such examination would validate the BoAML index as a valid benchmark.
- 4.5.23 The CC did not use such an extended period to validate the use of the Reuters Datastream index in the Q5 period.³³
- 4.5.24 BA has provided evidence that when benchmarked against the iBoxx index over the same period as the BoAML index that excludes the financials, the Q5 CoD was significantly generous (see paragraph 4.5.8 above). So it is not clear how examining the latter index over an extended period would overturn that evidence.
- 4.5.25 To be consistent, both the BoAML and iBoxx indices would have to be examined over the 1996-2012 period. But it is unclear how this would lead to any conclusion that overturns the evidence based on the iBoxx index.

³³ In the Stansted report, for example, the CC used Datastream (now Reuters Datastream) index yields during March 2004 to September 2008. It used this index to estimate the cost of new debt for Stansted. So the CC did not use a long period to validate the index it used. For the cost of embedded debt it did not use a benchmark index, just the coupons of the actual bonds of BAA excluding re-financing costs (pp672-676 of Stansted report).

- 4.5.26 It is not clear how focusing on the nominal cost, as suggested by HAL, would lead to a different conclusion from the one supported by BA's analysis. If both the CSLB and BoAML yields were calculated on the same basis i.e. nominal YTM at the same time of indices of the same maturity, their yield performance relative to HAL would not change even if inflation levels were taken into account since the same inflation number would be used to deflate the nominal yields.
- 4.5.27 HAL's criticism of BA's arguments against the use of the BoAML index for the purpose of validating the Q5 cost of debt lacks a robust rationale.
- 4.5.28 HAL does not provide any numerical evidence to support its assertion that spreads on financial firms' bonds have returned to those of corporates. Even if they have, use of an index that includes such financials for the purpose of validating the Q5 cost of debt would still be inappropriate because of average spreads over the Q5 period would still reflect the abnormal spreads experienced by financial firms.
- 4.5.29 The CAA's conclusion that the fairness of the Q5 cost of debt at 3.4% is borne out by an appropriate benchmark index is not well-founded. Similarly, the benchmark indices used by the CAA do not provide a robust basis for concluding that the CAA's analysis of HAL's actual bonds delivers an appropriate cost of embedded debt for Q6. This is significant in circumstances where the discussion above indicates that there are serious issues with the analysis that the CAA has done of HAL's bonds in estimating the cost of embedded debt for Q6.

5 COST OF NEW DEBT

5.1 Overview

5.1.1 The CAA uses two alternative methods to estimate the cost of new debt:

- (a) Evidence of traded yields for HAL's and GAL's bonds; and
- (b) Evidence from benchmark indices.

5.1.2 I have been asked to provide my opinion on issues related to both methods. The questions I have been asked to address and my summary answers are as follows:

On traded yields:

- **Did the CAA err in its calculation of the appropriate average of the traded yields?** I conclude that the CAA did err in its calculations. I cannot see how PwC came up with the average it did. It appears to be a simple computational error. I also cannot see why it is appropriate to take an average of the traded yields of both HAL and GAL bonds together rather than looking at HAL bonds in isolation.
- **Did the CAA err in its choice of bonds for calculating HAL's traded yields?** If the CAA has taken account of the traded yields for BB rated bonds (which appears likely) then I consider that it has erred in doing so because an assumption that the airport would need to issue BB rated bonds is inconsistent with the CAA's assumption that the notional efficiently financed airport would achieve a comfortable investment grade rating.

On the use of benchmark indices:

- **Did the CAA err in relying on a single cut-off date when making forecasts based on the benchmark indices?** I conclude that the CAA did so err. It should have looked at a range of dates.
- **Did the CAA err in taking an average of the HAL and GAL cost of debt and then adding extra for GAL?** I conclude that the CAA did err in this respect. PwC's alternative approach should have been used as it recognises that the average for HAL and GAL combined cannot be right if GAL's cost of debt is set above the combined average unless HAL's cost of debt is set below the combined average.

5.1.3 I have additionally been asked to provide my opinion on what cost of new debt the CAA should have applied if it had not made the errors discussed above. In doing this, I have additionally taken account of the inflationary error discussed in section 3 of this report. The values to adopt will depend not only on how one chooses to correct the individual errors but also on whether one places more weight on the evidence of traded yields or on the evidence derived from benchmark indices.

5.2 Traded yields: did the CAA err in its calculation of the appropriate average of the traded yields?

- 5.2.1 The CAA in its FP relies on an average calculated by PwC of the YTM of HAL and GAL's traded bonds at 4.7% nominal (Table 7.4 and p38, PwC Report, October 2013). PwC derives a real yield of 2.6% from the average of nominal traded bond yields by subtracting its expected inflation rate of 2.8% from the nominal yield and then adding a forward premium of 70 basis points.
- 5.2.2 The CAA thus starts with a traded bonds-based real cost of 2.6%. The CAA says on this basis, and taking account of a real cost range of 2.2-2.9% that PwC derived from benchmark indices, that it considers 2.6% to be the midpoint of PwC's range.
- 5.2.3 Since PwC's inflation estimate is 2.8% but CAA's range is 3 to 3.1%, the CAA adjusts PwC's midpoint down by 0.1% in order, so it says, to take account of its higher inflation estimate to reach a point estimate of 2.5% for HAL.

BA's arguments over PwC's averaging of traded bond yields

- 5.2.4 BA argues that PwC has incorrectly averaged the nominal traded yields at 4.7% whereas it should be no more than 4.6% at most (Annex B, p31-33, BA's Response). This means that the real cost of HAL's debt based on the traded bonds using PwC's inflation estimate is no more than 2.5% ($4.6 - 2.8 + 0.70\%$) not 2.6% as assumed by the CAA. When this figure is adjusted down for the higher RPI inflation assumed by the CAA (3.0-3.1% vs 2.8), the real cost of HAL's new debt based on traded yields cannot be more than 2.3%.
- 5.2.5 BA also challenges PwC and the CAA's decision to calculate the average of traded yields on the basis of an average of HAL's and GAL's bonds combined. BA cannot see any good reason for taking account of GAL's bonds in calculating the cost of debt for HAL.

HAL's response

- 5.2.6 HAL has not addressed the above errors highlighted by BA.

The CAA's response in the Section 15(1) Notice

- 5.2.7 As already noted above, the CAA has not directly engaged with the specific arguments on cost of debt advanced by BA (or any other party) in the Section 15(1) Notice or Section 15(1) Technical Appendix.
- 5.2.8 The CAA however confirms the average of 4.7% calculated by PwC is correct but gives no further details of its calculation (paragraph 5.54, *ibid*).

My assessment

- 5.2.9 I can see no answer to BA's argument on the computational accuracy of the average. It may be that PwC and the CAA can provide some explanation in due course but none has been provided so far. At this point, it appears that PwC and the CAA have clearly erred on this point.

5.2.10 On the point about using both HAL and GAL bonds to come up with an average for the two combined rather than separate averages for HAL and GAL I, again, can see no answer to BA's argument. There is no advantage to combining the data from both and it simply introduces inevitable error in circumstances where the airports have different credit ratings. Using a combined average attributes to HAL part of the cost arising from GAL's lower credit rating.

5.3 Traded yields: did the CAA err in its choice of bonds for calculating HAL's traded yields?

5.3.1 It is not entirely clear which bonds were used by PwC in calculating traded yields. Appendix 3 to PwC's October 2013 report to the CAA appears to suggest that BBB rated and BB rated bonds were taken into account in the average. It does, however, say that there were some bonds for which no data was available from its source, Datastream, and it does not say which bonds those were. It is clear that non-sterling bonds were not taken into account.

BA's arguments on PwC's choice of bonds for calculation of traded yields

5.3.2 BA argues in its response to the Final Proposals that inclusion of HAL's bonds rated lower than A- in the estimation of the cost of its new debt is inappropriate for the same reasons as were presented earlier in the context of the CAA's estimation of HAL's cost of embedded debt (BA's Response to CAA's FP, Annex B, pp33-35).

5.3.3 Considering the YTM of HAL's A- rated bonds alone – spot, 6 month average, 1 year average and 2 year average – BA estimates the average nominal yield at 3.3%. This leads, after deduction of the CAA's inflation estimate of 3%, to a real yield of 0.3%. Adding the forward premium of 0.7% results in the cost of HAL's new debt being 1%.

5.3.4 BA compares this low cost to the real yields on Bloomberg's A and BBB rated Utilities indices. The nominal yields on these indices range between 3.03% to 3.36%, the average being lower than the yield on HALs A rated debt. Thus when judged against relevant industry specific benchmark indices, HAL's cost of new debt at 1% seems justified.

5.3.5 BA estimates that, compared to the 2.5% proposed by the CAA in its Final Proposal as the cost of HAL's new debt it, the cost of HAL's new debt should only be 1% the reduction being attributable to: (i) 20 basis points due to the correction of the technical errors made by PwC and the CAA; and (ii) 130 basis points due to the exclusion of HAL's non-A rated debt (p35, *ibid*).

HAL's response

5.3.6 HAL notes that BA claims a 55 basis points reduction in the cost of embedded debt due to removal of subordinated debt on p31 whereas it claims a 130 basis points reduction on p35 of its Response (HAL's Response to BA's Response).

- 5.3.7 HAL also questions the accuracy of some of the yield figures reported by BA in the table on p33 of Annex B of its Response.
- 5.3.8 HAL disagrees that HAL's bonds rated below A- should be excluded since the CAA targets a minimum investment grade of BBB+/ BBB for HAL and they are therefore appropriately included by the CAA in its estimation of the cost of HAL's new debt.
- 5.3.9 HAL reiterates that BA has benefited from HAL's ability to issue A- rated debt and this derives from its WBS financing approach.
- 5.3.10 HAL also questions the accuracy of the 130 basis points reduction from the removal of non A- rated bonds.

The CAA's response in the Section 15(1) Notice

- 5.3.11 As already noted above, the CAA has not directly engaged with the specific arguments on cost of debt advanced by BA (or any other party) in the Section 15(1) Notice or Section 15(1) Technical Appendix.

My assessment

- 5.3.12 Since the conceptual arguments for the removal of subordinated debt made by BA or against their removal made by HAL are the same as in the context of HAL's embedded debt, I shall not repeat my assessment here except in one respect.
- 5.3.13 The composition of HAL's embedded debt i.e. the preponderance of A- rated debt well in excess of the target gearing of 60% followed by BBB and BB rated debt is a legacy financial structure. HAL, however, may have a different capital structure in the future in which it reaches the target gearing not exclusively with A-rated debt but also with BBB rated debt. In that event the case for excluding debt below A- rating is weak.
- 5.3.14 Since in estimating the cost of new debt, the CAA is looking forward, it cannot exclude the possibility that HAL's mix of bonds to arrive at the target gearing level would include BBB rated bonds as well.
- 5.3.15 Given this possibility, the CAA is more justified than in the case of embedded debt to estimate the cost of new debt that included BBB rated debt.
- 5.3.16 However, the CAA should exclude any debt rated below the target rating of BBB.
- 5.3.17 Given the foregoing assessment, I consider that BA's estimate of the cost of new debt for HAL based on A-rated debt alone is not sustainable but the exclusion of BB rated debt alone may have a material impact. I do not have the data to express a view as the PwC advice does not separately list the traded yields for BB rated bonds. BA's estimate of a reduction of 130 basis points would not be an appropriate one to use since it is based on the exclusion of both BBB and BB rated debt together.³⁴

³⁴ I would additionally note that I have not verified BA's estimate.

5.4 Benchmark indices: did the CAA err in relying on a single cut-off date when making forecasts based on the benchmark indices?

BA's arguments

- 5.4.1 In Annex C to its Response to CAA's FP for HAL (same as Annex A to its Response to CAA's FP for GAL), CEPA argues that:
- PwC (and hence the CAA) places too great a reliance on a particular date for the spot yield and forward rate but such data are subject to volatility in both forward and spot rates;
 - The date chosen i.e. 27 June 2013 by PwC is one that corresponds to the highest data point for the spot cost of debt estimate and for the forward rates for the calendar year.
- 5.4.2 CEPA calculates the cost of new debt for HAL using a range of spot yields at different dates starting from 1 April 2013 to 27 June 2013 (Table 1, p43 of Annex C, *ibid*). It uses the iBoxx 10-15 year A and BBB non-financial corporate indices for the spot yields.
- 5.4.3 CEPA adjusts the spot yields to estimate the forward looking cost of debt for Q6 by applying the forward rate adjustment based on a conversion multiple of 0.8 assumed by PwC (applied to the change in the expected forward rate for gilts).
- 5.4.4 The real cost of new debt for Q6 is highest, 2.31%, at 27 June 2013 which forms the basis of the CAA's FP. In contrast, the average for the period April to October 2013 is 1.82% and the current rate in October 2013 was only 1.64%.
- 5.4.5 This, CEPA argues, suggests that using the spot yield on a single date to estimate the forward looking cost of new debt for Q6 generates a high and unreliable estimate.
- 5.4.6 CEPA offers an alternative methodology that relies on the real 10 year daily average yields of the indices rather than the single date spot yield. It finds that as of 30 October 2013 this produces an overall cost of debt of only 2.23% and 2.28% averaged over April to October 2013 (this cost is the blended cost of embedded and new cost in the proportions of 70 to 30 respectively, not just the cost of new debt).
- 5.4.7 Considering that the CAA's estimate in its FP of HAL and GAL's overall cost of debt is 3.2% inclusive of fees of 15 basis points and 20 basis points respectively, CEPA argues that the CAA has overestimated the two airports' cost of debt by over 85 basis points (pp43-44, Annex C, *ibid*).
- 5.4.8 CEPA therefore considers the CAA's reliance on a single date's spot rate to be a flawed methodology that results in overestimating the airport's cost of debt.

HAL's response

- 5.4.9 HAL agrees with CEPA that the cost of new debt is sensitive to the choice of the cut-off date. In fact it says that it has suggested averaging over previous 3 months in order to avoid dependency on spot rates (HAL's Response to BA's Response, pp11-12).

5.4.10 HAL, however, disagrees with CEPA's estimate and the magnitude of the alleged overestimation by the CAA. It also argues that the spot cost of debt and the forward rates were the highest on 27 June 2013 only if one considered the real yields and not the nominal yields that PwC focused on.

The CAA's response in the Section 15(1) Notice

5.4.11 The CAA argues that its estimate of 2.5% as the cost of new debt is robust to the single cut-off date chosen by PwC for the following reasons:

- (a) the forward-looking adjustment made by PwC allows for increase in yields going forward and 'movements in the market since PwC's cut-off date are consistent with PwC's recommendations' (para 59, *ibid*);
- (b) PwC tested its assumption on the cost of new debt to recent period averages; and
- (c) the CAA also set out the 12 month average for A and BBB rated bonds of 1.1% and 1.8% respectively. These averages suggest that cost of new debt (including the forward premium of 70 basis points) is in the region of 1.8% and 2.5%.

5.4.12 The CAA also argues that its estimate of the cost of new debt for HAL is broadly correct. In particular, it refers to HAL's bond issue in October 2013, which has a yield of 4.6% and equates this to its own calculations in the Final Proposals, after taking inflation into account (see paragraph 5.61 -5.62, *ibid*).

My assessment

- 5.4.13 I consider that reliance on a single cut-off date is fraught with error since it ignores the volatility of both spot and forward rates. An average of both rates over a period of time is a more robust methodology. Both HAL and CEPA agree on this point.
- 5.4.14 The CAA does not provide references to the 'movements in the market since PwC's cut-off date (which) are consistent with PwC's recommendations'.
- 5.4.15 It is clear from the CAA's Section 15(1) Notice response that the average over the previous 12 months would produce a cost of new debt in the range 1.8% to 2.5% and the point estimate of 2.5% chosen by the CAA is at the very top of this range. The CAA does not offer any justification for choosing this top-of-the-range estimate.
- 5.4.16 Given that this range is based on the 12 month average which is more appropriate than an estimate based on a single date, a reasonable estimate for the cost of HAL's new debt is the mid-point of that range i.e. 2.15%.

- 5.4.17 This estimate includes the forward-looking adjustment of 70 basis points which, the CAA implies, somehow offsets the error that arises from using a single cut-off date. Since this forward-looking adjustment is a common element in PwC's estimate and the above estimate based on the CAA's 12 month average, it does not eliminate the overestimation of the cost of HAL's new debt due to PwC's choice of a single cut-off date.
- 5.4.18 The 12-month average mid-point therefore provides a more robust estimate of the cost of new debt. This avoids undue reliance on outlier estimates as of single dates. This suggests that the CAA has overestimated the cost of new debt by at least 35 basis points based on its own 12 month average.
- 5.4.19 I consider that judging whether the spot cost and the forward cost are highest on 27 June 2013 is appropriately made on the real cost basis by CEPA since the CAA seeks to set the cost of capital in real terms.
- 5.4.20 As regards the comparison with HAL's October 2013 bond issue, when its yield of 4.6% is deflated at 3.05% inflation (the mid-point of CAA's range) using the Fisher formula and the forward premium is added, the real yield is only 2.2% which is closer to the 2.15% based on the 12 month average than to the 2.5% assumed by the CAA in its FP.
- 5.4.21 Moreover, the tenor of this bond is extremely long and its cost is therefore likely to be considerably larger than the cost based on either HAL's other bonds or the benchmark indices. This yield should therefore be regarded as an outlier and is not a reasonable benchmark for estimating HAL's new debt.

5.5 Overall cost of debt: Is the CAA's comparison of the overall cost of debt for HAL with the CC's cost of debt determination for NIE valid?

- 5.5.1 The CAA seeks to justify its estimate of the overall cost of debt for HAL and GAL by comparing it with the CC's estimate of the cost of debt for NIE in its provisional determination. It shows that, assuming the inflation rate of 2.8%, the Fisher formula, the 80:20 split between embedded debt and new debt and fees of 0.3% (all the same as the CC's assumptions for NIE) the overall cost of debt for HAL would be 3.26% (para 5.39, *ibid*).
- 5.5.2 The CAA then argues that this represents a difference of just 0.06% from its final proposal of 3.2% and that, therefore, "the CC's provisional determination does not suggest the CAA should revise its final proposals for the cost of debt" (para 5.40, *ibid*).

My assessment

- 5.5.3 This is a very odd comparison. It is not clear why the CAA should substitute the CC's assumptions about inflation and fees relevant to NIE for its own used to estimate the airports' cost of debt. Why should the nominal cost of embedded debt of 6.3% be deflated using the CC's assumed inflation rate of 2.8% when the CAA itself assumed a higher range of 3.0 - 3.1%?

- 5.5.4 Why should the fees which the CC considers appropriate for NIE be relevant to HAL especially since the CAA itself has estimated a lower level of fees i.e. 0.15% as being appropriate for HAL? The CAA did not include an allowance for holding costs in estimating the cost of new debt for HAL in the final proposals for Q6, 'consistent with its previous price control' (para 5.63, *ibid*). How do such costs then become relevant in comparing with the NIE's cost of debt?
- 5.5.5 Further, the cost of new debt that the CC has estimated for NIE is based on its BBB rating whereas the rating appropriate for HAL is A- to BBB. Yet the CAA, in this comparison, ignores this important difference. Moreover, the CC was influenced by NIE's small size relative to the comparator utilities in choosing a higher range of the debt premium that it added to the benchmark risk free rate (The CC's Provisional Determination of NIE's cost of capital, November 2013, p13-21). It would require an extraordinary stretch of regulatory imagination to consider that HAL should qualify for a small company premium on its debt.
- 5.5.6 These considerations obviously make NIE's cost of debt higher than HAL's thus rendering the comparison invalid.
- 5.5.7 The CAA also assumes that the 80:20 split that the CC has assumed for NIE is appropriate for HAL. How is this split relevant to HAL's cost of debt when the CAA has assumed a 70:30 split in its FP?
- 5.5.8 The whole exercise seems to be the CAA's attempt to show somehow that its cost of HAL's debt is reasonable when compared to the CC's estimate. But it is an illogical and meaningless exercise. While it is appropriate to follow the CC in applying the Fisher formula and even assume the same rate of inflation as the CC (although there is no valid reason for doing the latter since both the CC and the CAA depend on external independent sources for inflation estimates and these can differ), it is incorrect for the CAA to assume the same debt split and the same holding cost as the CC has assumed for NIE. The first two are not specific to NIE or HAL whereas the latter two are. To compare the cost of debt of NIE and HAL by equating the debt split and the holding cost is like comparing chalk and cheese.
- 5.5.9 The CC's methodology in the NIE determination also differs from that used by the CAA. The CC in the provisional determination for NIE has differed from the CAA's approach in the determination of both the cost of embedded debt and the cost of new debt. In its determination of the cost of embedded debt it uses only the actual yields to maturity of NIE's bonds. It considers debt indexation as a methodology and prefers not to use it on grounds that it is a matter of policy decision and requires pre-notification (CC, NIE PD, para 13.55-56, p 13-16).
- 5.5.10 In the case of new debt, the CC use the RFR + debt premium approach. It estimates the benchmark gilt yield and then adds an estimated debt premium (spread) (CC, NIE PD, paras 13.67 to 13.74). The CC has used the same approach in its previous determination i.e. Bristol Water in 2010.

5.5.11 In estimating the cost of embedded debt, the CAA uses two alternative approaches: estimate the actual YTM at issuance of HAL's bonds and the YTM at issuance of A and BBB rated bonds. In estimating the cost of new debt, the CAA again uses the actual bonds to estimate the current YTM and the benchmark indices' current YTM. To this current yield it adds the forward 'premium' which is estimated by regressing the change in corporate bond yields on change in gilt yields, the bonds and gilts being of comparable maturity.

5.5.12 Given the methodological differences in estimating the cost of new debt, it is difficult, if not impossible, to draw any sensible conclusions on the overall cost of debt from the CC's provisional determination on NIE.

5.6 Benchmark indices: did the CAA err in taking an average of the HAL and GAL cost of debt and then adding extra for GAL?

5.6.1 PwC splits the blended range of 2.2% to 2.9% into 2.2% to 2.65% for HAL and 2.45% to 2.9% for GAL to allow for the higher risk associated with GAL in its advice to the CAA. The CAA, however, takes the mid-point of the range for HAL as the mid-point of the blended range for HAL and GAL combined and then compensates GAL by adding 25 basis points to that figure.

BA's arguments

5.6.2 BA argues that the CAA was wrong to take this approach because it ignores PwC's advice without any justification and, in doing so, makes HAL's cost of new debt partly dependent on the costs of debt incurred by GAL even though GAL is acknowledged as having higher borrowing costs. BA contends that the CAA should have used the midpoint of the PwC range specifically calculated for HAL. This would be 2.4% real, which is 20 basis points lower than the midpoint assumed by CAA.

My assessment

5.6.3 I do not see the rationale for the CAA to take the average of the range 2.2-2.9% drawn from the yields of benchmark indices to benchmark the debt of both HAL and GAL. PwC advised separate ranges for HAL (2.2-2.65%) and for GAL (2.45-2.9%) which are more logical and reflect their relative riskiness and the investment ratings appropriate to each airport, A- for HAL and BBB+ for GAL (PwC, Report to the CAA, October 2013, pp40-41).

5.6.4 A logical midpoint of range for HAL is therefore 2.4 (rounded down from 2.425, mid-point of 2.2-2.65%) and not 2.6 assumed by the CAA. When the higher inflation range assumed by the CAA (3.0 -3.1%) compared to the PwC assumption of 2.8% is taken into account, the cost of new debt based on benchmark indices becomes $2.4 + 2.8 - 3.05 = 2.15$ or 2.2%.

5.6.5 This points to an error of 0.2% in the CAA's estimate of the cost of new debt for HAL.

6 COST OF EQUITY

6.1 Overview

6.1.1 I have been instructed to give my opinion on whether the CAA has used an excessively high equity beta for HAL.

6.1.2 In summary, my conclusion is that it has. The evidence indicates strongly that the equity beta is less than 1, not the 1.1 used by the CAA.

6.2 Has the CAA erred in choosing 1.1 as HAL's equity beta?

BA's arguments on the equity beta

6.2.1 BA's argument that HAL's equity beta is less than 1 rests on its view that HAL's systematic risk is less than that of the UK stock market which by definition has equity beta of one.

6.2.2 BA cites the views of capital market participants and rating agencies to support its view that HAL's equity beta is < 1 .

6.2.3 BA also applies its Four Tests as a way of assessing HAL's risk and how it is likely to have declined from Q5:

- Profit performance: HAL's profit performance is better than that of the market as a whole indicating it is less risky than the market;
- Gearing: High gearing and high investment grade rating enjoyed by HAL, despite the high gearing, point to its low risk exposure;
- Finance: HAL has raised very large funds of about £8bn in the last four years suggesting its perceived risk is low;
- Use of cash: HAL's high EBITDA and its ability finance a large proportion of its capex with its operating cash flow suggests its business is not excessively risky.

6.2.4 BA also applies a fifth test called 'wider systematic risk' and principally highlights the high risk to airlines and the end users of HAL airport as a result of high prices to compensate for HAL's beta > 1 .

6.2.5 BA's argument that HAL's beta in Q6 should be less than its beta in Q5 also rests on the following developments since then:

- Segmentation of its capex into core and development components as well as the introduction of a new licence-based regimes with risk lowering potential effects;
- Comparator betas apart from Fraport's and ADP's have displayed declining betas

6.2.6 BA and CEPA suggest a range of 0.9-1.0 for HAL's equity beta with a point estimate of 0.95, slightly less than the market's equity beta of 1.

6.2.7 BA also finds that HAL faced its most significant reversal in 2009 with -1.4% decline in EBITDA in any year in Q5 up to 2011. This performance is much better than the range of 0 to -5% for FTSE 100 companies (fn 134, PwC p88).

6.2.8 BA has argued that airlines are exposed to greater systematic risk than the airports whose equity betas should therefore be much lower than those of airlines.

Views of PwC and Fitch

6.2.9 PwC accepts that “*HAL and GAL showed resilient performance in the challenging macroeconomic conditions during Q5*”. It cites BA’s evidence that HAL’s growth in EBITDA over the 5 year period prior to 2011 was around 16% to 17% and was markedly above the average across the FTSE 100 index of around 5%-10% over a comparable time frame.

6.2.10 PwC finds that its own evidence is consistent with BA’s evidence – the maximum EBITDA drawdown of -1.4% experienced by HAL in 2009 compared very favourably with the -14% for non-financial FTSE 100 companies.

6.2.11 PwC concludes that these numbers support the suggestion of “the strong operational performance” of the airport through the recession.

6.2.12 HAL’s resilience is also noted by Fitch the rating agency:

“LHR’s performance through the recent economic crisis was one of the strongest in the industry with a maximum peak-trough fall in traffic of just 3.4%. This is due to a combination of factors that Fitch considers stable over time.”

6.2.13 Fitch identifies the following factors contributing to HAL’s strong performance through the economic crisis:

- London as a world business centre;
- Location and connectivity with the well-off western and central districts of London;
- LHR’s capacity constraint with only 2 runways servicing 70m+ pax giving rise to unsatisfied demand that allows any demand shocks to be absorbed;
- The Stable Outlook reflects the expectation that Heathrow will continue to post a stable performance, despite weak economic prospects. (quote from Fitch in PwC, *ibid*, p88).

6.2.14 PwC also concludes: “whilst absolute level of revenue and profit variability increased over Q5, there is no evidence that the relative risk positioning of the Designate Airports compared to the wider market worsened” (PwC, *ibid*, p89).

6.2.15 Since beta is a function of market-relative risk i.e. covariation with the market rather than volatility per se, PwC’s conclusion is supportive of the view that HAL’s beta may have declined.

- 6.2.16 PwC assesses whether the risk profile i.e. the asset and equity betas of the airports have materially changed since Q5 by examining the evolution of 9 comparator airports' asset and equity betas (Appendix 9 to PwC Report to CAA, October 2013). PwC uses these betas as benchmarks and as a means of analysing how they changed over time, rather than as a means of drawing a point estimate for HAL.
- 6.2.17 PwC notes that comparator airports are not perfect benchmarks since they differ from HAL in the form of regulation e.g. price vs revenue cap, dual vs single till, their macroeconomic environment etc.
- 6.2.18 PwC relies on the average of the sample betas rather than on the betas of individual airports such as Fraport or ADP groups.
- 6.2.19 The sample average equity beta is estimated at 0.87 (6 month average) at 27 June 2013 compared to 0.82 on 11 March 2008. The average asset beta is 0.57 at 27 June 2013 compared to 0.64 at 11 March 2008 (Appendix 9, *ibid*)³⁵.
- 6.2.20 Two things are of note here. The average equity beta of comparator airports remained stable, but was between 0.82 and 0.87 well below 1 that BA has argued for, for HAL. The average asset beta was between 0.57 and 0.64 which, however, is above the range assumed in Q5. But the asset beta of these airports declined suggesting a lowering of the business risk of the airports since 2008.
- 6.2.21 PwC agrees with BA's position on the relative riskiness of airports and airlines. It notes that "airlines respond to downside demand shocks through lower yields and increasing load factors which helps to protect airports from declining passenger volumes. This is an important factor that influences the overall risk of the airports" (p90, *ibid*).
- 6.2.22 PwC estimates the 6 month sample average equity beta as 0.96 and asset beta as 0.71 for airlines. The comparable estimates for airports are 0.87 and 0.54 respectively (p125, *ibid*). Thus airports' average equity and asset betas are both much smaller than airlines' betas.
- 6.2.23 PwC also observes that the mid-point asset betas of HAL (0.47) and GAL (0.52) in Q5 are lower than the airlines' 6 month average airline asset beta of 1.01 at the time of the Q5 decision on 11 March 2008 and also lower than the current estimates of 0.71.
- 6.2.24 The CAA also considers in more detail the asset betas for two individual comparator airports – Fraport the German group that operates Frankfurt and several other airports, ground handling, retail and rail services; and AdP the French group that owns Paris CdG airport as well as other airports. These airports are dual till airports unlike HAL, which increases their risk exposure but are under revenue cap rather than price cap regulation which probably reduces their risk exposure. These differences mean that these two airport groups are not very good benchmarks for HAL although they own Frankfurt and CdG airports that are of comparable size and importance to HAL.

³⁵ I cite the 6-month averages rather than the spot estimates because they are more robust.

6.2.25 PwC, Europe Economics for HAL and CEPA for BA have estimated the asset betas for Fraport and AdP using alternative gearing definitions based on net and gross debt, different estimation periods and different return intervals. The CAA averages these estimates made by the three consultants and reports them in its Figure 7.2 of its FP.

HAL's response

6.2.26 HAL disputes BA's contention that HAL's equity beta is 'unambiguously' less than one and argues that such definitive conclusions cannot be drawn from the benchmarking exercises, fundamental modelling and the 3rd moment CAPM modelling undertaken by PwC and EE.

6.2.27 In any case, HAL argues, "a company's equity beta is a function of its gearing. Heathrow's 60% notional gearing is relatively high compared to most quoted companies and so an equity beta greater than 1 should not be unexpected" (HAL's Response to BA's Response, p12).

My assessment

6.2.28 Since HAL is not traded on stock markets, one has to rely on evidence on betas of suitable proxies. It is widely accepted that there are no perfect proxies for HAL.

6.2.29 CAA, PwC, HAL, the airlines and their advisers have relied on beta estimates for comparator airports and airlines as noted above. They have also analysed the underlying operating cash flow performance of HAL and comparator airports to infer how HAL's asset and equity betas may have changed since Q5.

6.2.30 Airports' and airlines' betas have information value because they are conceptually similar to HAL's betas i.e. they measure sensitivity of firm level and equity level investor returns in relations to the market returns.

6.2.31 Operating cash flow measures are not direct measures of investor returns but they are the source from which investor returns i.e. interest to debt investors and dividend to equity investors are derived. HAL's operating cash flows are the direct source of returns to their debt and equity investors. Their movement relative to the corresponding market-wide cash flow is therefore a very useful indicator of the change in the risk profile of HAL.

6.2.32 The two categories of performance measures – proxy betas and HAL's operating cash flows – provide complementary evidence.

6.2.33 As noted earlier, the CAA considers the asset betas of Fraport and AdP in some detail but "is cautious to be overly precise about calculating HAL's beta from Fraport and AdP's beta but considers that HAL has lower systematic risk than these airports because of the strong demand for HAL coupled with it operating closer to capacity" (CAA's FP, paras 7.69-7.71 on the differences between HAL and these two airports).

6.2.34 Given these differences among these three airports, it is perhaps prudent to place more reliance on the sample average betas as recommended by PwC and accepted by the CAA.

Report of : Professor Sudarsanam
Specialist Field : Cost of Capital
On Behalf Of : British Airways Plc and Virgin Atlantic Airways Ltd

6.2.35 The table below shows the airlines' and airports' equity and asset betas in in 2008 and in 2013 (based on 6 month averages) drawn from the various estimates described above:

Proxy	2008		2013	
	Equity beta	Asset beta	Equity beta	Asset beta
Airports (PwC) (range)	0.82	0.64	0.87	0.57 0.42 to 0.72
Fraport				0.54**
AdP (PwC+EE+CEPA)				0.59**
Airlines	> 1*	1.01	0.96	0.71
HAL	0.9 to 1.15	0.47	1.10	0.50
GAL	1.0 to 1.3	0.52	1.13	0.56

Source: PwC Report to CAA, October 2013, pp93-94 and Appendix 9; * rough estimate from Figure A9.2, *ibid.* **Figure 7.2, p71, CAA's FP; HAL and GAL asset beta point estimates for 2008 from CC's Q5 determination (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, pp205-209) and from the CAA, Section 15(1) Notice, January 2014, p52 for 2013.

- 6.2.36 The table shows that airports' average equity beta has increased marginally from 2008. PwC does not present the airlines' average equity beta in 2008 but from its Figure A9.2 (PwC Report to CAA, p125) it appears that the average may be well above 1 suggesting that airlines' average equity beta has fallen. Nevertheless, the CAA concludes that HAL's equity beta has not declined.
- 6.2.37 Trend in airlines' betas is a good indicator of the underlying trend in airports' betas since both airlines and airports face the same underlying demand uncertainties in passenger and freight traffic although airlines face different input uncertainties e.g. price of oil.
- 6.2.38 As a pointer to the downward trend in HAL systematic risk, the airlines' asset and equity betas have more information content than the airports' betas since the comparator airports in PwC's sample do not all have the same exposure to traffic risk, regulatory differences, single vs dual till, the macroeconomic environment etc.
- 6.2.39 The airlines' asset betas show a substantial decline between Q5 decision and now i.e. from 1.01 to 0.71. This to some extent parallels the decline in the comparator airports' asset beta from 0.64 at 11 March 2008 to 0.57 at 27 June 2013 (airports' equity beta increased from 0.82 to 0.87 between the two dates but remained well below 1).

- 6.2.40 The evidence points to the equity beta of HAL being much lower than airlines' equity betas and also much lower than 1. The evidence on both the airlines' asset betas and comparator airports' asset betas also points to a decline in asset beta of HAL from Q5.
- 6.2.41 The airlines' average asset beta in particular shows that the systematic risk of the aviation business has declined significantly. Since, as noted by PwC (see paragraph 6.2.21 above), airlines lessen the impact of adverse and risky developments on the airports they use, it is a reasonable inference that airports such as HAL with their strong exposure to the airlines that constitute the airline sample analysed by PwC have also experienced significant decline in systematic risk.
- 6.2.42 The above table shows that HAL's proposed asset beta is not only smaller than the airports' and airlines' asset betas in 2013 but its Q5 beta was also smaller in 2008. In contrast to the decline in the asset betas of airports and airlines between 2008 and 2013, PwC concludes that HAL's asset beta has not changed. The CAA concludes, from its point estimate, that it has actually increased from 0.47 to 0.50. Neither conclusion flows from the evidence that the CAA and PwC have presented.
- 6.2.43 The inference of decline in HAL's asset and equity betas becomes even stronger when the beta-based evidence is read in conjunction with the evidence of strong and resilient performance of HAL in terms of EBITA, ability to finance its capex with its own operating cash flow etc., discussed earlier, and reinforced by Fitch's view of HAL as a strong and resilient airport performer. As noted earlier, HAL's firm level cash flows, EBITDA, are relatively insensitive to a downturn in the UK market which reflects a low asset beta and this insensitivity has increased since Q5 (see paragraphs 6.2.9 to 6.2.15 above).
- 6.2.44 I consider on the basis of the evidence from the comparator airports' beta, airlines' beta and the declining sensitivity of HAL's operating cash flow to market-wide corporate cash flow that HAL's asset beta has declined from its level estimated for Q5 and that its equity beta has also declined³⁶.
- 6.2.45 The CAA's judgement that HAL's asset and equity beta ranges are broadly unchanged from Q5 lacks empirical support. The CAA notes that "PwC gave more weight to the notion of betas remaining unchanged as opposed to declining over time – as there were a number of moving parts underlying the risk benchmarking across comparator airports and HAL (such as the difference in regulatory framework which imply uncertainty in the relative positioning of risk)" (CAA's FP, para 7.57).
- 6.2.46 While the benchmarking of the betas of airports which have not been listed on the UK stock market is an admittedly difficult and imprecise exercise, it is also important for the regulator to give due weight to whatever evidence is available. It is clear that both PwC and the CAA have failed to give due weight to the downward trend in airports' and airlines' asset betas. While they have anchored their Q6 beta estimate for HAL in the Q5 range, they have failed to make sufficient adjustment for the downward drift since Q5.

³⁶ Given a constant notional gearing of 60% between Q5 and Q6 and a constant (assumed) debt beta of 0.10, a fall in asset beta would result in a fall in equity beta.

- 6.2.47 The CAA's point asset beta estimate of 0.50 suggesting that HAL's asset beta has actually increased from 0.47 in Q5 runs counter to the evidence based on airports' and airlines' asset betas which have declined significantly and point to a similarly significant decline in HAL's asset beta.
- 6.2.48 A careful interpretation of the evidence suggests that a point estimate of HAL's equity beta is likely to be well below the comparator airports' average beta of 0.87 and the airlines' equity beta of 0.96. These average betas also suggest that the bottom end of any range for HAL must be lower than the 0.9 to 1.15 proposed by CAA.
- 6.2.49 The range for HAL equity beta proposed by the CAA in the FP is therefore unsubstantiated by evidence and is on the high side. While the regulator has to use its judgement in selecting the relevant range from the available evidence, the CAA's selection of the range for HAL's equity beta i.e. 0.9 to 1.15 lacks credible empirical support.
- 6.2.50 As regards BA's argument that the introduction of a core and development approach to capex would reduce risk, it is difficult to assess its impact on the sensitivity of HAL's cash flows or returns to the market-wide cash flows and returns and, therefore, on their betas.
- 6.2.51 As regards HAL's response to BA's contentions, it is true that a firm's equity beta is a function of its gearing and that HAL's notional gearing is high. However, equity beta is a positive function of the firm's asset beta and a negative function of the debt beta and a positive function of its gearing (in estimating cost of capital the CAA has however assumed a constant debt beta of 0.10).
- 6.2.52 Thus low asset beta can offset the effect of high gearing. When asset beta falls, the equity beta also falls if the level of gearing is unchanged. So the available evidence does not contradict BA's view that HAL's equity beta is likely to be less than one if it maintained the notional gearing of 60%.

7 CONCLUSIONS

7.1 INFLATION

7.1.1 I have been asked to provide my opinion on a single issue in relation to inflation. The question raised and my summary answer is as follows:

- **Has the CAA erred in how it has taken account of inflation in its estimates for the cost of debt?** In particular, I am asked to address whether the CAA should have used the Fisher formula to deflate nominal values and whether it should have made greater adjustments to figures produced by PwC given the CAA's conclusion that inflation was likely to be greater than PwC had forecast. My conclusion is that the CAA should have used the Fisher formula and should have made greater adjustments to reflect the difference between its inflation forecast and that used by PwC.

7.2 COST OF EMBEDDED DEBT

7.2.1 The CAA uses two alternative methods to estimate the cost of embedded debt:

- (a) Evidence of HAL's actual bonds; and
- (b) Evidence from benchmark indices.

7.2.2 I have been asked to provide my opinion on issues related to both methods. The questions I have been asked to address and my summary answers are as follows:

On HAL's actual bonds:

- **Did the CAA err when it chose to exclude non-sterling debt issued by HAL?** I conclude that the CAA did err in excluding non-sterling debt because doing so artificially inflates the average tenor of HAL's debt and thereby increases the cost of debt.
- **Did the CAA err when it chose not to exclude subordinated debt issued by HAL with a credit rating of BBB or BB?** I conclude that the CAA did err in failing to exclude BBB and BB rated debt from its calculation. HAL's actual performance over Q5 shows that a notional efficiently financed airport in HAL's position would not have needed to issue any debt with less than an A- rating if it maintained the 60% gearing that the CAA assumes a notional airport would maintain.
- **Did the CAA err in failing to exclude re-financing incentives?** I conclude that the CAA did err in failing to exclude re-financing incentives. The factual evidence indicates that HAL provided incentives to its lenders to accept a refinancing arrangement with less restrictive covenants. Those incentives offer no benefits to passengers and were rightly excluded by the CC in its Q5 determination. They should have been excluded this time as well.

On the use of benchmark indices:

- **did the CAA err in using benchmark indices including bonds issued by financial institutions?** I conclude that the CAA did err in this respect. In its Q5 decision, the CAA quite deliberately chose to use a benchmark index excluding bonds issued by financial institutions in order to avoid artificially increasing the cost of debt as a consequence of the unusual circumstances affecting financial institutions. I see no justification for adopting a different approach on this occasion.

7.2.3 I have additionally been asked to provide my opinion on what cost of embedded debt the CAA should have applied if it had not made the errors discussed above. In doing this, I have additionally taken account of the inflationary error discussed in section 3 of this report. The values to adopt will depend not only on how one chooses to correct the individual errors but also on whether one places more weight on the evidence of HAL's actual bonds or on the evidence derived from benchmark indices.

7.2.4 As a general point, it is important that evidence from either method – benchmark indices or actual bonds – is not tainted by any error. Where an inappropriate benchmark index is chosen leading to an inflated benchmark cost of debt and an inappropriate portfolio of actual bonds is chosen leading to an inflated actual cost of debt, the two estimates may be mutually supportive leading to a semblance of accuracy. Such apparent precision must be seen to be the result of two errors compounding each other and not as the outcome of a robust methodological process. To assume that the similarity of estimates enhances the credibility of the determination is to be lulled into a false sense of reliability and misplaced confidence.

7.2.5 I therefore consider whether there are errors in the choice of benchmark indices and in the choice of the relevant portfolio of HAL's actual bonds and how these errors lead to errors in the estimate of the cost of embedded debt for HAL. I also highlight whether these errors reinforce one another in such a way as to create a (false) appearance of robustness in the CAA's estimates.

7.2.6 My views on the individual corrections and the overall corrected cost of embedded debt can be summarised as follows:

Issue/ Airlines' position	CAA position	My numerical correction/ position
HAL's actual bonds(nominal)		
Inclusion of non-sterling debt	No need since sterling debt proxies for non-sterling debt	- 37 basis points
Exclusion of BBB and BB debt	Exclusion of BB debt makes no material difference	At least - 46 basis points ³⁷
Exclusion of refinancing incentives	Not considered	- 17 basis points

³⁷ I have only been able to look at the impact of removing BB debt. I do not have the data to calculate the impact of removing BBB debt.

Issue/ Airlines' position	CAA position	My numerical correction/ position
Benchmark indices (nominal)	<ul style="list-style-type: none"> • BoAML index including financials used to validate Q5 CoD; • Same index used to derive cost of embedded debt for Q6; 	<ul style="list-style-type: none"> • Inappropriate, but not providing a corrected alternative. • Inappropriate. I do not have access to the index used by the CAA for Q5 so do not offer a view on the right value to use.
Adjustment for difference in PwC and CAA inflation forecasts	None.	-20 to -30 basis points
Overall cost of embedded debt (after inflation)		At least -120 to -130 basis points (subject to comparison with data from an appropriate benchmark index)
Reduction in overall cost of debt at 70:30 debt split		At least -84 to -91 basis points
Reduction in pre-tax real WACC at 60% gearing		At least -50 to -54 basis points

7.3 COST OF NEW DEBT

7.3.1 The CAA uses two alternative methods to estimate the cost of new debt:

- (a) Evidence of traded yields for HAL's and GAL's bonds; and
- (b) Evidence from benchmark indices.

7.3.2 I have been asked to provide my opinion on issues related to both methods. The questions I have been asked to address and my summary answers are as follows:

On traded yields:

- **Did the CAA err in its calculation of the appropriate average of the traded yields?** I conclude that the CAA did err in its calculations. I cannot see how PwC came up with the average it did. It appears to be a simple computational error. I also cannot see why it is appropriate to take an average of the traded yields of both HAL and GAL bonds together rather than looking at HAL bonds in isolation.
- **Did the CAA err in its choice of bonds for calculating HAL's traded yields?** If the CAA has taken account of the traded yields for BB rated bonds (which appears likely) then I consider that it has erred in doing so because an assumption that the airport would need to issue BB rated bonds is inconsistent with the CAA's assumption that the notional efficiently financed airport would achieve a comfortable investment grade rating.

On the use of benchmark indices:

- **Did the CAA err in relying on a single cut-off date when making forecasts based on the benchmark indices?** I conclude that the CAA did so err. It should have looked at a range of dates.
- **Did the CAA err in taking an average of the HAL and GAL cost of debt and then adding extra for GAL?** I conclude that the CAA did err in this respect. PwC's alternative approach should have been used as it recognises that the average for HAL and GAL combined cannot be right if GAL's cost of debt is set above the combined average unless HAL's cost of debt is set below the combined average.

7.3.3 I have additionally been asked to provide my opinion on what cost of new debt the CAA should have applied if it had not made the errors discussed above. In doing this, I have additionally taken account of the inflationary error discussed in section 3 of this report. The values to adopt will depend not only on how one chooses to correct the individual errors but also on whether one places more weight on the evidence of traded yields or on the evidence derived from benchmark indices.

7.3.4 If the cost of new debt is calculated based on the traded yields, correction of the two errors that relate to that and for which I can currently provide figures (namely under-deflation and PwC's erroneous average) point to a figure of no more than 2.3% (see paragraph 5.2.4 above). There may be an additional downward movement from removal of BB rated bonds but I have no way yet of knowing how much that might be worth (see paragraph 5.3.17).

- 7.3.5 If the benchmark indices are used to calculate the cost of new debt, correction of the error in using a single spot rate points to a cost of new debt of 2.15% (see paragraph 5.4.16). Splitting the range (1.8-2.5%) into separate sub-ranges for HAL and GAL further reduces the figure. PwC advised lowering the top of the overall range by 0.25% to derive the HAL-specific range. Applying the same approach to the 1.8-2.5% range produces a HAL-specific range of 1.8-2.25%. The mid-point of that range is 2.025%, which can be rounded down to 2%.
- 7.3.6 Given that the CAA, probably rightly, puts more weight on the benchmark data and given also that removal of the BB bonds will further reduce the figure of 2.3% derived from traded yields, I consider that 2% would be the right figure to use for the cost of new debt. This compares to the figure of 2.5% used by the CAA. The overall cost of debt therefore reduced by 15bps and the real pre-tax WACC by 9bps.

7.4 COST OF EQUITY

- 7.4.1 I have been instructed to give my opinion on whether the CAA has used an excessively high equity beta for HAL.
- 7.4.2 In summary, my conclusion is that it has. The evidence indicates strongly that the equity beta is less than 1, not the 1.1 used by the CAA.
- 7.4.3 If a beta value of 1 were used, the post-tax cost of equity would be 6.25% (58 basis points less) and the pre-tax real WACC would be 30 basis points less.

8 EXPERT'S DECLARATION

- 8.1** I understand that my duty in providing written reports and giving evidence is to help the CC (if there is an appeal), and that this duty overrides any obligation to the party by whom I am engaged or the person who has paid or is liable to pay me. I confirm that I have complied and will continue to comply with my duty.
- 8.2** I confirm that I have not entered into any arrangement where the amount or payment of my fees is in any way dependent on the outcome of the case.
- 8.3** I know of no conflict of interest of any kind, other than any which I have disclosed in my report.
- 8.4** I do not consider that any interest which I have disclosed affects my suitability as an expert witness on any issues on which I have given evidence.
- 8.5** I will advise the party by whom I am instructed if, between the date of my report and the conclusion of any appeal, there is any change in circumstances which affect my answers to points 9.3 and 9.4 above.
- 8.6** I have shown the sources of all information I have used.
- 8.7** I have exercised reasonable care and skill in order to be accurate and complete in preparing this report.
- 8.8** I have endeavoured to include in my report those matters, of which I have knowledge or of which I have been made aware, that might adversely affect the validity of my opinion. I have clearly stated any qualifications to my opinion.
- 8.9** I have not, without forming an independent view, included or excluded anything which has been suggested to me by others, including my instructing lawyers.
- 8.10** I will notify those instructing me immediately and confirm in writing if, for any reason, my existing report requires any correction or qualification.
- 8.11** I understand that:
- my report will form the evidence to be given under oath or affirmation;
 - questions may be put to me in writing for the purposes of clarifying my report and that my answers shall be treated as part of my report and covered by my statement of truth;
 - the CC may at any stage direct a discussion to take place between experts for the purpose of identifying and discussing the expert issues in the proceedings, where

possible reaching an agreed opinion on those issues and identifying what action, if any, may be taken to resolve any of the outstanding issues between the parties;

- the CC may direct that following a discussion between the experts that a statement should be prepared showing those issues which are agreed, and those issues which are not agreed, together with a summary of the reasons for disagreeing;
- I may be required to attend before the CC to be cross-examined on my report by a cross-examiner assisted by an expert;
- I am likely to be the subject of public adverse criticism by the judge if the CC concludes that I have not taken reasonable care in trying to meet the standards set out above.

8.12 Although only relevant by analogy in the CC, I have read Part 35 of the Civil Procedure Rules and the accompanying practice direction including the “Protocol for Instruction of Experts to give Evidence in Civil Claims” and I have complied with their requirements so far as relevant.

9 STATEMENT OF TRUTH

I confirm that I have made clear which facts and matters referred to in this report are within my own knowledge and which are not. Those that are within my own knowledge I confirm to be true. The opinions I have expressed represent my true and complete professional opinions on the matters to which they refer.

Signature :

Date :

APPENDIX 1

CURRICULUM VITAE

Professor Puliyyur (Sudi) Sudarsanam

- Freelance Senior Consultant to Cambridge Economic Policy Associates, London.
NB *I do not have any regular retainer arrangement at this point in time.*
- Previously, Member of the Competition Commission (CC), the UK's independent antitrust authority and Member of the merger panel and utilities panel (April 2005 to March 2013)
- Member of the CC's Finance & Regulatory Group (FRG) an expert group advising on cost of capital and other financing issues and on regulated industries (2006-2013)
- See Appendix 1.1 for list of cases I was involved in at the CC.

Academic positions:

- Emeritus Professor of Finance & Corporate Control, Cranfield School of Management (2010)
- Professor of Finance & Corporate Control, Cranfield School of Management (2000-09)
- Director, Centre for Research in Economics & Finance (CENREF), Cranfield School of Management (2005-09)
- Professor of Finance & Accounting, Cass (previously, City University) Business School, London (1997-1999)
- Senior Lecturer in Financial Management and Accounting at Cass (1994-96)
- Lecturer in Financial Management and Accounting at Cass (1986-1994)
- Lecturer in Business Finance, University of Leeds (1980-1985)

Academic qualifications

- PhD (Accounting & Business Finance) (Cass Business School, City University, London) (1977-81).
- MSc (Finance) (Cass Business School, City University, London) (1976-77)
- MSc (Physics) (Madras, India) (1966-68)
- BSc (Physics) (Madras, India) (1963-66)

Professional qualifications

- Associate of the Chartered Institute of Bankers, London (ACIB) (since 1976)
- Graduate Member of the Institute of Export, London, 1976; winner of three prizes in the Final Part 1 and of Certificate of Exceptional Merit in Final Part 2 Examinations of the Institute

Visiting Academic positions

- Visiting Professor in Mergers & Acquisitions, Imperial College Business School, London (2010 -)
- Senior Visiting Fellow at Mergers & Acquisitions Research Centre, Cass Business School, London (2008-2015)
- Visiting professor in finance and in M & A, Santa Clara University, California, (January and March 2008 and 2009)
- Management Centre Institute, Innsbruck, Austria (2005-7)
- ALBA Graduate Business School, Athens, in M & A (2004-5, 2007-08)
- M & A the University of Szczecin, Poland (2004-5)
- Donau University at Krems, Austria, (2002, 2004)
- Athens University of Economics and Business (2000, 2001)
- University of Vienna (1999)
- Donau University at Krems, Austria (1998)
- Kenan-Flagler Business School, University of North Carolina, Chapel Hill (1998)
- Visiting Professor in International Finance: University of Notre Dame, Indiana, USA on their London MBA programme (1986-98)

Personal Research and Scholarship

See Appendix 1.2 for details.

Teaching experience

Taught the following courses on MSc, full-time MBA, Exec MBA, modular MBA programmes and undergraduate programmes:

- Management Accounting; Financial Accounting; Accounting & Financial Analysis; Corporate Valuation;
- Corporate Finance; International Corporate Finance;
- Mergers, Acquisitions and Divestments (MAD); Corporate Restructuring (CRS),
- Private Equity, Corporate Governance, and Investment Banking

Europe Journal-related positions

Formerly Associate Editor, Journal of Business Finance & Accounting

Associate Editor, Review of Behavioural Finance (John Wiley)

Research Editor for the Special Interest Group of the British Accounting Association on Corporate Governance until 2004

Appendix 1.1

Professor Sudi Sudarsanam

My participation in Competition Commission inquiries from 2005 to 2013

Year	Regulatory case	My role as
2012	Phoenix Natural Gas price determination	FRG member
2011	BT v Ofcom; EE v Ofcom; Hutchison 3G v Ofcom; Vodafone v Ofcom: wholesale mobile voice call Termination	FRG member
2010	Bristol Water plc: Price Determination	FRG member
2010	The Carphone Warehouse Group plc v Ofcom appeal: wholesale line rental price control	Inquiry group member
2009	Cable & Wireless UK v Ofcom appeal: leased lines price control	FRG member
2009	The Carphone Warehouse Group plc v Ofcom appeal: local loop unbundling price control	Inquiry group member
2008	Stansted Airport: A regulatory price control review (Q5)	Inquiry group member
2007	A report on the economic regulation of the London Airport Companies (Heathrow and Gatwick) (Q5)	Inquiry group member
Year	Merger case	My role as
2012	Epwin-Latium	Inquiry group member
2012	VPS-Sitex Orbis	Inquiry group member
2007	Kemira Growhow and Terra Industries	Inquiry group member
2005	Vue Cinema	Inquiry group member

Appendix 1.2

Personal Research and Scholarship

1. Publications

1.1 Refereed Journal Articles

On corporate governance, finance and related topics:

“Determinants of earnout as acquisition payment currency and bidder’s value gains” (with Leonidas Barbopoulos), *Journal of Banking & Finance*, 36, 678-694, 2012

“Corporate governance convergence in Germany through shareholder activism: Impact of the Deutsche Boerse bid for London Stock Exchange” (with Tim Broadhurst), *Journal of Management and Governance*, 16, 235-268, 2012

“Target bankruptcy risk and its impact of going-private buyout performance and exit”, *Corporate Governance: International Review*, 19 (3), 240-258, 2011

“Determinants of takeover premium in cash offers: An option pricing approach, *Journal of Business Finance & Accounting*, 37 (5) and ((6), 687-714, 2010

“Management’s going concern disclosures: Impact of corporate governance and auditor reputation”, *European Financial Management Special Issue on Corporate Governance* (with J-Y Uang, R Taffler and D Citron) (2006)

“Are friendly acquisitions too bad for shareholders and managers? Long term value creation and top management turnover in hostile and friendly acquirers”, *British Journal of Management*, 17, S7-S30, 2006 (with A Mahate) (2006).

Ranked among top twenty papers from *BJM* in the previous three years on the basis of frequency of citations and 9th in the previous year in terms of download

“The role of internal auditors in mergers, acquisitions and divestitures: An international study”, *International Journal of Auditing*, 7, 3, November 2003

“Corporate Governance: Overview and Research Agenda”, *British Accounting Review*, 32, 341-354, December 2000 (with Mike Wright and Istemi Demirag)

“Corporate restructuring in response to performance decline: impact of ownership, governance and lenders” (with J Lai), *European Finance Review*, 1, 2, 1997

“Financial Distress, Asset Sales and Lender Monitoring”, *Financial Management*, Vol 25, No 3, 68-85, Autumn 1996 (with M A Lasfer and R J Taffler).

“Shareholder Wealth Gains in Mergers: Effect of Synergy and Ownership Structure”, *Journal of Business Finance and Accounting*, July 1996 (with Holl and Salami)

“Large Shareholders, Takeovers and Target Valuation”, *Journal of Business Finance and Accounting*, March 1996

“The Role of Defensive Strategies and Ownership Structure of Target Firms: Evidence from UK Hostile Takeover Bids”, *European Financial Management*, Vol. 1, No. 3, November 1995

On other finance topics

- “Determinants of financial ratio covenants and pricing of debt in private debt contracts: The UK evidence”, *Accounting & Business Research* (with Lance Moir) 37, 2, 2007
- “Real Options and the Impact of Intellectual Capital on Corporate Value”, *Journal of Intellectual Capital*, 7, 3, 291-308 (with B Marr and Ghulam Sorwar) (2006)
- “Discussion of ‘Increasing market share as rationale for corporate acquisitions’ ” in *Journal of Business Finance & Accounting*, 31, 1&2, Jan/March 2004
- “Glamour acquirers, method of payment and post-acquisition performance: The UK evidence” (with Ash Mahate), *Journal of Business Finance & Accounting*, 30 (1) & (2), Jan/March 2003
- “Rational expectations, analysts’ forecasts of earnings and sources of value gains for takeover targets” (with A Salami and G Alexandrou), *Journal of Banking and Finance*, 26, 2002, 153-177
- “Corporate financial distress and turnaround strategies: An empirical analysis”, *British Journal of Management*, 12,183-199, 2001 (with J Lai)
- “Mergers, acquisitions and joint ventures” in *International Encyclopaedia of Business and Management*, Thomson International, 2 edition, 2001
- “Shareholder wealth effects of corporate sell-offs: Impact of growth opportunities, economic cycle and bargaining power”, *European Financial Management*, 7, 2, June 2001 (with G Alexandrou)
- “Mergers, Acquisitions and Joint Ventures” in *The Concise International Encyclopaedia of Business and Management* (ed) M Warner, Thomson Publishing (1997)
- “Effectiveness of corporate turnaround strategies: An empirical analysis”, *Proceedings of the Annual Conference of British Academy of Management*, 1997
- “Mergers, acquisitions and joint ventures” in *International Encyclopaedia of Business and Management*, Thomson International, 1st edition, 1996
- “Financial Ratio Proportionality and Inter-temporal Stability: An Empirical Test”, *Journal of Banking and Finance*, 1995 (with R J Taffler)
- “The Effect of Corporate Divestments on Shareholder Wealth: The UK Experience”, *Journal of Banking and Finance*, 1992 (with Afshar and Taffler)
- “Market and Industry Structure and Corporate Cost of Capital”, *Journal of Industrial Economics*, June 1992
- “Defensive Strategies of Target Companies in UK Contested Takeovers”, *Managerial Finance*, vol 17, no 6, 1991
- “Industry Classification in UK Capital Markets: A Test of Economic Homogeneity”, *Applied Economics*, April, 1985 (with R J Taffler)
- “Auditing the Board: A New Approach to Measuring Company Performance, *Managerial Finance*, 1980 (with R J Taffler)

1.2 Books and research reports

Cost of Equity for Regulated Companies: An international Comparison of Regulatory Practices, Competition Commission UK, Discussion paper, November 2011

Creating value from mergers & acquisitions: The challenges, Integrated and International Perspective, 2nd edition (FT Prentice Hall, 2010) (translated in to Chinese)

Corporate Governance and Corporate Finance: A European Perspective (Editors: Ruud van Frederikslust, University of Amsterdam; James Ang, Florida State University, and Sudi Sudarsanam) (Routledge, London, 2007)

Financial Reputation Drivers and their Impact on Shareholder Value, research report prepared for Ernst & Young, London, 2007

Creating value from mergers & acquisitions: The challenges, Integrated and International Perspective, October 2003 (FT Prentice Hall) (see Annexure 2 for a selection of post- and pre-publication reviews from journals and academics) (Chinese edition published in 2007)

Mergers, Acquisitions and Divestitures: Control and Audit Best Practices, The Institute of Internal Auditors Research Foundation, Florida, USA, 2002.

The Essence of Mergers and Acquisitions, 1995, published by Prentice Hall International (translated into Spanish, Polish, Chinese, Indonesian and Thai) (on the best-seller list of *Financial World*, magazine of the Institute of Financial Services, UK and a main text book on M & A in many leading universities. Polish edition a leading textbook on M & A at many leading Polish universities).

1.3 Professional Journals, Articles, Contributions to Book etc.

“Value creation and value appropriation in M & A deals” in R Joseph, D. Faulkner and S. Teerikangas, (eds) *The Handbook of Mergers & Acquisitions* (Oxford University Press, 2012)

“Executive Compensation and Managerial Overconfidence: Impact on Risk Taking and Shareholder Value”, in Greg N. Gregoriou and Luc Renneboog (eds): *International Mergers and Acquisitions Activity Since 1990: Quantitative Analysis of Recent Research*, a volume in the QUANTITATIVE FINANCE series (Elsevier Inc., 2007)

“Hostile or friendly takeover: Does it matter?” in *Handbuch Integriertes Mergers & Acquisitions Management*, (2006), (Ed: Prof. Bernd Wirtz, University of Witten, Germany) (publisher: Gabler Company, Germany’s best known publisher of business titles)

“Valuation of intellectual capital and real option models” (with G Sorwar and B Marr) in "Perspectives on Intellectual Capital: Multidisciplinary Insights Into Management, Measurement, and Reporting (ed: B Marr), El Sevier (2005)

“Creating value through demergers” in *Managing Mergers and Acquisitions, CBI Business Guide*, May, 2000

“Corporate Governance, Corporate Control and Takeovers”, in *Advances in Mergers and Acquisitions* (eds: Alan Gregory and Cary Cooper), JAI Press, 2000.

“Mergers, Size and Value”, *Oxford Energy Forum*, contribution to forum on mergers in the oil & gas industry, May 2000

“Short termism: myth or reality?” *INFORMED*, Journal of the Investor Relations Society, July 1997.

“The importance of bid dynamics”, *Acquisitions Monthly*, June 1997

“Less than lethal: Defensive Strategies in UK Contested Takeovers”, *Acquisitions Monthly*, January 1994.

“How Homogeneous are London Stock Exchange Industry Groupings?”, *Investment Analyst*, April 1984.

APPENDIX 2

SOLICITORS INSTRUCTIONS

I have been provided with the following written instructions:

- i.* Letter of Instruction dated 29 November 2013, Baker & McKenzie LLP / Richard Pike;
- ii.* Retainer Letter dated 11 December 2013, Baker & McKenzie LLP / Richard Pike; and
- iii.* Guidance For Expert Report.

I also met with Baker & McKenzie LLP and their clients to discuss my instructions and received written and oral comments on various drafts of my report.

APPENDIX 3

DOCUMENTS CONSIDERED

I have reviewed and used the following documents in my report and the formulation of my conclusions:

1. *Estimating the cost of capital in Q6 for Heathrow, Gatwick and Stansted - a report by PwC* [consultants employed by the CAA] (April 2013) (http://www.caa.co.uk/docs/78/CAA_CostofCapital_Final_250413_CLEAN.pdf) plus terms of reference issued by the CAA to PwC (<http://www.caa.co.uk/docs/78/Cost of capital scope Q6.pdf>);
2. *Cost of capital for UK designated airports - paper on the split cost of capital and skewed returns by PwC* (April 2013) (<http://www.caa.co.uk/docs/78/Q6PwCCofCapitalSplitSkewed.pdf>);
3. *Economic regulation at Heathrow from April 2014: Initial proposals* (April 2013) (<http://www.caa.co.uk/docs/33/CAP 10 Economic regulation at Heathrow from April 2014 initial proposals.pdf>);
4. *Economic regulation at Gatwick from April 2014: Initial proposals* (April 2013) (<http://www.caa.co.uk/docs/33/CAP1029 Economic regulation at Gatwick from April 2014 initial proposals.pdf>);
5. *Estimating the cost of capital for designated airports - a report prepared for the CAA by PwC* (October 2013) (http://www.caa.co.uk/docs/78/PwC_CAA_CostofCapital_Designated_Airports_Oct.pdf);
6. *Estimating the cost of capital: a technical appendix to the CAA's final proposals for economic regulation of Heathrow and Gatwick after April 2014* (October 2013) (<http://www.caa.co.uk/docs/33/CAP1115.pdf>);
7. *Economic regulation of Heathrow Airport Limited after April 2014: the CAA's final proposals* (October 2013) (<http://www.caa.co.uk/docs/33/CAP 1103.pdf>);
8. *Economic regulation of Gatwick Airport Limited after April 2014: the CAA's final proposals* (October 2013) (<http://www.caa.co.uk/docs/33/CAP1102.pdf>);
9. *Setting the weighted cost of capital for Heathrow and Gatwick in Q6 - report by CEPA for British Airways* (April 2013) (<http://www.caa.co.uk/docs/78/CEPAAirportWACCestimates.pdf>);
10. *Review of choice of high percentile WACC from a range in its initial proposal for cost of capital for HAL and GAL - report for CEPA and British Airways by Professor Sudarsanam* (June 2013) (http://www.caa.co.uk/docs/78/BA_Sudarsanam_Review_of_CAA-25_June_2013.pdf);
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