

# WACC value selection above the midpoint of a range and the risk of double compensation

Note prepared for British Airways<sup>1</sup>

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## Headroom within the point estimate

The final step of the CAA's cost of capital methodology in its Q6 Initial Proposals for Heathrow and Gatwick airports was to explicitly select point values above the midpoint of the ranges for each airport provided by their consultant (PwC).<sup>2</sup> We argue that these percentile selections made by the CAA are not justified and add a further layer of "headroom" beyond that already factored into the constituent WACC component values underlying the consultant's ranges.

In the remainder of this note we consider in turn:

- the impact of the CAA's percentile uplift on the WACC;
- the consequent impact on allowed revenues; and
- argue that the adjustment made by CAA to protect against underinvestment cannot be justified, particularly in the context of a low-investment period for the airports in question and its broader implications.

## Percentile selection impact

Table 1 below shows the premium that CAA has implicitly proposed for each airport through the selection of a WACC value above the midpoint of their consultant's ranges.

Table 1: WACC impact compared to midpoint, pre-tax real

	Initial proposal value	Midpoint value	Premium to midpoint	Premium over midpoint
Heathrow	5.35%	4.92%	+ 43 bp	+8.74%
Gatwick	5.65%	5.27%	+ 38 bp	+7.21%

Source: CAA and CEPA

The premia shown in Table 1 above, of 43 bp for Heathrow and 38 bp for Gatwick are not large, but once their impacts on allowed revenues are considered and the weakness of their justification is understood, it becomes clear that these uplifts are not acceptable for the industry's stakeholders.

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<sup>2</sup> Heathrow: see paragraph 9.132 [http://www.caa.co.uk/docs/33/CAP\\_1027\\_Economic\\_regulation\\_at\\_Heathrow\\_from\\_April\\_2014\\_initial\\_proposals.pdf](http://www.caa.co.uk/docs/33/CAP_1027_Economic_regulation_at_Heathrow_from_April_2014_initial_proposals.pdf)

Gatwick: see paragraph 10.158 [http://www.caa.co.uk/docs/33/CAP\\_1029\\_Economic\\_regulation\\_a\\_Gatwick\\_from\\_April\\_2014\\_initial\\_proposals.pdf](http://www.caa.co.uk/docs/33/CAP_1029_Economic_regulation_a_Gatwick_from_April_2014_initial_proposals.pdf)

## Revenue impacts

Table 1.2 below shows the undiscounted revenue impacts from CAA's uplift policy.

Table 1.2: Impact of high percentile choice, £m 2011/12 prices

	Return	2014/15	2015/16	2016/17	2017/18	2018/19
<b>Heathrow</b>						
Average RAB		13,720	13,763	13,755	13,677	13,525
80 <sup>th</sup> percentile return	5.35%	734.0	736.3	735.9	731.7	723.6
50 <sup>th</sup> percentile return	4.92%	675.0	677.1	676.7	672.9	665.4
Difference	43bp	<b>+ 59.0</b>	<b>+ 59.2</b>	<b>+ 59.1</b>	<b>+ 58.8</b>	<b>+ 58.2</b>
<b>Gatwick</b>						
Average RAB		2,382	2,416	2,452	2,473	2,461
75 <sup>th</sup> percentile return	5.65%	134.6	136.5	138.5	139.7	139.0
50 <sup>th</sup> percentile return	5.27%	125.4	127.2	129.1	130.2	129.6
Difference	39bp	<b>+ 9.2</b>	<b>+ 9.3</b>	<b>+ 9.4</b>	<b>+ 9.5</b>	<b>+ 9.5</b>
<b>Total</b>						
Total difference		<b>+ 68.2</b>	<b>+ 68.5</b>	<b>+ 68.6</b>	<b>+ 68.3</b>	<b>+ 67.6</b>

Source: CAA and CEPA

Table 1.2 above shows that CAA's policy is projected to result in additional revenue of over £58m each year at Heathrow and £9m each year at Gatwick. The combined total additional (undiscounted) revenue from both airports over five years is an expected £341m, a substantial sum that should not be granted without sound justification.

### Identifying the double application of headroom

While uncertainty around WACC parameters can be effectively tackled on the debt side through mechanistic indexation, there is currently no good alternative for the cost of equity.

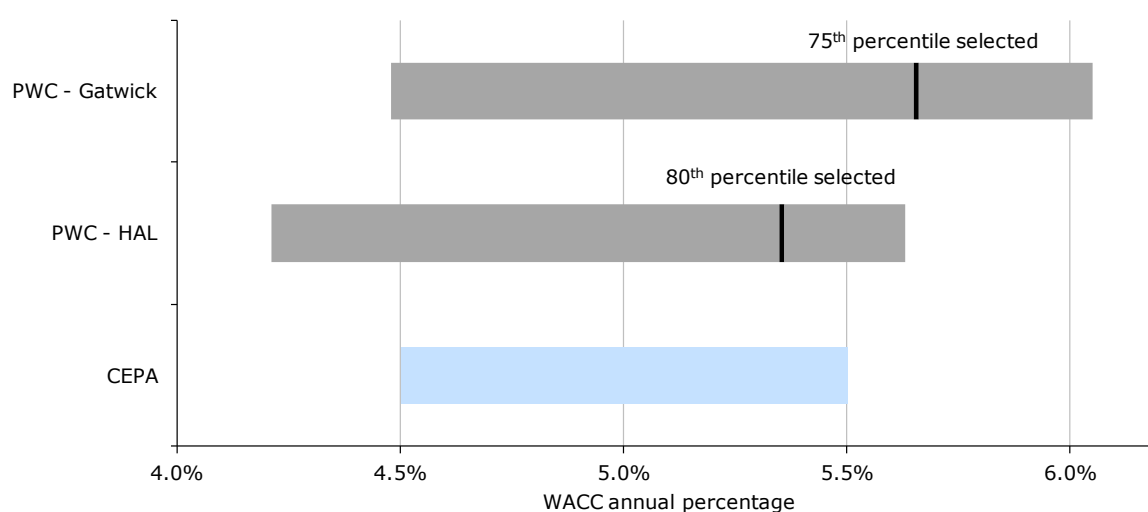
This process of adding headroom to the WACC may be explicit or not. We argue that the CAA is proposing to add further to this margin explicitly, through high percentile choices, based on a range that has a premium implicitly built into it.

Figure 1 below shows the CAA's WACC selections set within their consultant's ranges and in the context of the range proposed by CEPA.

The generosity of the CAA's preferred ranges can be seen in their large sizes compared to those calculated by CEPA in the February 2013 paper, (Gatwick 57% wider and 42% wider for Heathrow) and their upwards skew (while both ranges have a low value below CEPA's, their top ends are much higher). This gives the top ends of the PwC values a potentially speculative interpretation, that CAA might take care to not put so much weight on.

Picking a value high in their ranges exaggerates the headroom already factored into the individual parameter range of values. Given that there is headroom in both the lower bound and upper bound of these estimates, using a point estimate from the upper end of the already inflated range would give airports a doubly generous buffer, at the expense of passengers and the airlines.

Figure 1.1: Comparison of Initial Proposals WACC selection in consultants' ranges



Source: CAA and CEPA

### Rejecting the additional justification for headroom

Regulators routinely provide “headroom” for companies in their WACC determinations to account for skewed probabilities, outcomes or simply due to an understandable lack of information on the future direction of components such as the risk free rate.

In the Q6 Initial Proposals CAA cite their motivations for headroom as a balance between:

- a high WACC that over-rewards airport investors at the cost of users paying more than they should; and
- a low WACC that leads to underinvestment and costly financial distress.

This major justification is flawed in three respects:

1. it ignores the role of airlines on customer experience;
2. it exaggerates the impact of underinvestment; and
3. it is not based on evidence.

### *The role of airlines*

While the CAA considers the ultimate impacts on passengers, it ignores the countervailing impact on consumers intermediated via airlines. As passenger demand at the airports is not perfectly inelastic, airlines cannot pass on all of any increase in charges to customers. They must bear some of the cost themselves. This will inevitably affect their ability to invest in new routes and aircraft, both of which improve passenger experience and may be adversely affected in such a low-margin business. A more holistic view of the balance of risks might not have led the CAA to be so generous and to realise that this adjustment to the WACC partly serves to push the risk of underinvestment by airports at airports onto underinvestment by airlines at airports.

### *Exaggerated impact of underinvestment*

During the Q5 controls Heathrow had a forecast 35% projected RAB growth over the price control and Gatwick had forecast 33% growth. This level of investment intensity provides a stronger narrative to select high Q5 percentiles at the 77<sup>th</sup> percentile for Heathrow and the 75<sup>th</sup> percentile for Gatwick.

However with Heathrow's RAB projected to shrink by 2.1% over Q6 and Gatwick's to grow by only 3.1% in five years, the story clearly has materially changed.

It can also be argued that the percentile choices for Q5 were high independent of the ramp-up in investment,<sup>3</sup> and that the reality that financial distress and notable social costs have been avoided only serves to show that the previous levels were sufficient or more than sufficient. Maintaining these levels would serve to maintain previous levels of generosity in a manner that would not be justified even if similar levels of asset growth were to continue.

The bottom line is that investment incentives cannot be divorced from the levels of investment they are designed to support. During Q6 the RAB values at Heathrow and Gatwick are more or less at a steady state. In this context the risk of underinvestment is low because there is relatively low forecast investment.

### *Lack of evidence*

It is not clear whether CAA have sought any empirical support for the link between a low percentile choice and any out-turn underinvestment at a given price control. Either the prospect of receiving the midpoint over the life of the regulated assets or the nature of the business may mean that there is no need to provide additional compensation at each and every price control, as the CAA appears to propose.

CAA's consideration of the balance of risks points to setting a high WACC but the choice of the 75<sup>th</sup> and 80<sup>th</sup> percentiles appears entirely arbitrary beyond having used similar levels for Q5. This matters when every percentile is worth £9.72m p.a. at Heathrow and £1.91m p.a. at Gatwick.

In the Initial Proposals documents, the CAA notes that it has "reviewed recent regulatory decisions and notes that point estimates were between the 50th and 100th percentile of the range from which they were chosen." This is then used to justify retaining the high Q5 percentile choices for Q6.

We also argue that the evidence of WACC selections in the top half of ranges ignores much of the important detail. In December 2012, IPART, the multi-sector regulator in New South Wales similarly looked into the practice of choosing values in a range and came to consult on using a mid-point, rather than a high value.<sup>4</sup>

Looking closer at the recent UK evidence, the range of percentile choices made by Ofgem in their first RIIO determinations indicates that projected asset base growth rather than the avoidance of social costs is an important factor for choosing a high percentile.

The following section considers the choice in the context of the recent RIIO price control determinations by Ofgem.

### **Case study: RIIO T1 and RIIO GD1**

The recent Ofgem price control determinations provide a useful benchmark against which to compare the CAA's percentile choices. This is because the electricity transmission, gas transmission and gas distribution network businesses all arguably would result in greater social costs from underinvestment. For example a lack of investment in electricity transmission might result in blackouts or a failure to meet carbon reduction targets. A lack of investment in gas networks might lead to deaths through leakages or

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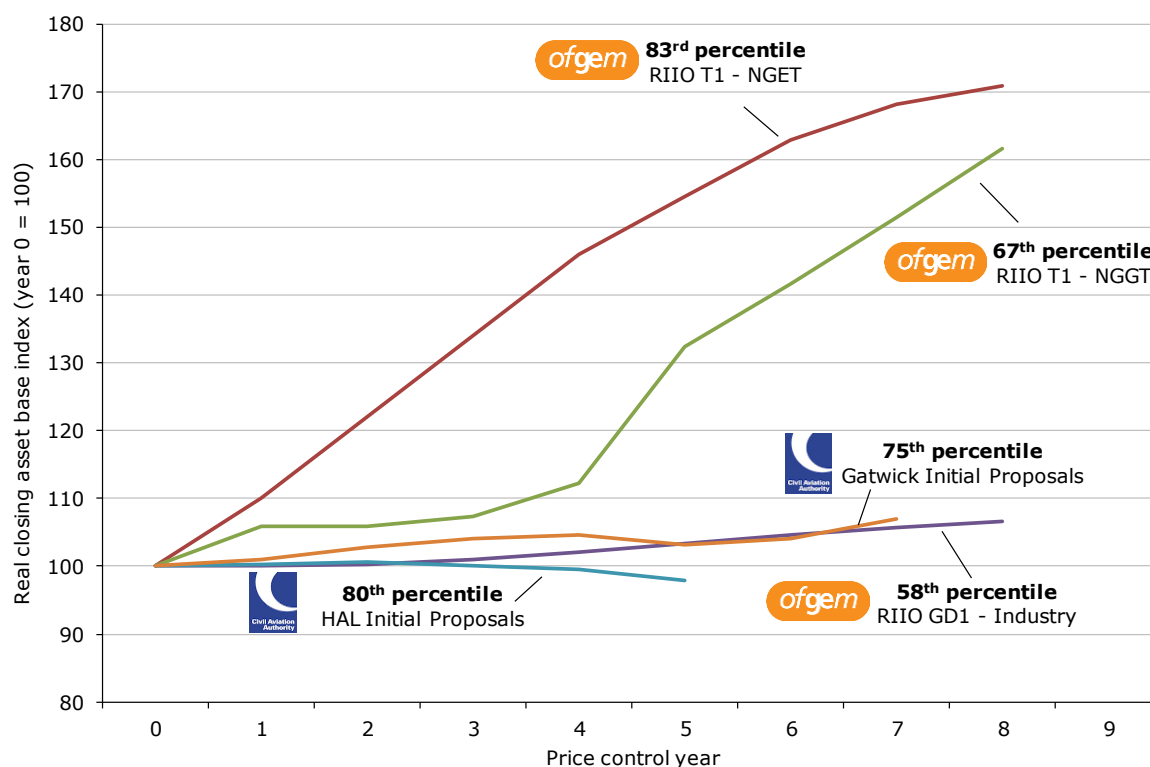
<sup>3</sup> CAA (2008) "Economic Regulation of Heathrow and Gatwick Airports 2008-2013: CAA decision"  
[http://www.caa.co.uk/docs/5/ergdocs/ccreport\\_appf.pdf](http://www.caa.co.uk/docs/5/ergdocs/ccreport_appf.pdf)

<sup>4</sup> IPART "Review of method for determining the WACC Dealing with uncertainty and changing market Conditions"  
[http://www.ipart.nsw.gov.au/files/8b337956-e2d6-45c1-8205-a12c00bf8bfc/Discussion\\_Paper\\_-\\_Review\\_of\\_method\\_for\\_determining\\_the\\_WACC\\_-\\_December\\_2012.pdf](http://www.ipart.nsw.gov.au/files/8b337956-e2d6-45c1-8205-a12c00bf8bfc/Discussion_Paper_-_Review_of_method_for_determining_the_WACC_-_December_2012.pdf)

the loss of heating for the elderly. By contrast a lack of investment in the airport sector would result in “deteriorating service quality over time.” Service quality certainly is important, but it cannot be seen as an oversized downside risk compared to the energy networks.

The detail of the recent Ofgem RIIO-T1 and RIIO-GD1 price controls provide useful information on the relative percentiles selected for each sector. Ofgem set cost of capital at the same time for electricity transmission (NGET) gas transmission (NGGT) and gas distribution but have widely different mark-ups. Figure 1.2 shows a high percentile choice in sectors growing their RAB in the price control, so as not to prejudice new investment, but modest aiming-up where the RAB is more stable.

Figure 1.2: Comparison of projected asset base growth and WACC percentile choice<sup>5</sup>



Source: Ofgem, CAA and CEPA calculations

Table 1.3: Ofgem RIIO WACC percentiles<sup>6</sup>

Sample	Low	High	Selected <sup>7</sup>	Percentile
RIIO – Gas Distribution 1	4.00	4.42	4.24 (4.20)	58 <sup>th</sup> (48 <sup>th</sup> )
RIIO-T1 National Grid Electricity Transmission	4.15	4.63	4.55	83 <sup>rd</sup>
RIIO-T1 National Grid Gas Transmission	4.08	4.53	4.38 (4.40)	67 <sup>th</sup> (71 <sup>st</sup> )

<sup>5</sup> The Ofgem “Best view” RAV values are used for the transmission companies. The growth would be lower but still substantial if we were to show the “Base view” numbers of 48.8% RAV growth for NGET and 17.9% growth for NGGT over the price control.

<sup>6</sup> Ofgem (2012) “RIIO-GD1: Final Proposals - Finance and uncertainty supporting document”

[http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/3\\_RIIODG1\\_FP\\_Finance\\_and\\_uncertainty.pdf](http://www.ofgem.gov.uk/Networks/GasDistr/RIIO-GD1/ConRes/Documents1/3_RIIODG1_FP_Finance_and_uncertainty.pdf)

Ofgem (2012) “RIIO-T1: Final Proposals for National Grid Electricity Transmission and National Grid Gas”

[http://www.ofgem.gov.uk/Networks/Trans/PriceControls/RIIO-T1/ConRes/Documents1/4\\_RIIOT1\\_FP\\_Finance\\_dec12.pdf](http://www.ofgem.gov.uk/Networks/Trans/PriceControls/RIIO-T1/ConRes/Documents1/4_RIIOT1_FP_Finance_dec12.pdf)

<sup>7</sup> Values in parenthesis use the WACC values stated in Final Proposals documents rather than the use of selected parameter values stated.

The gas and electricity transmission determinations included high percentiles but this was set in the context of significant projected asset base growth. If the WACC is not high enough it might jeopardise this growth. However in the gas distribution sector it was much lower, at the 58<sup>th</sup> percentile, perhaps partly reflecting that there is limited real growth in the industry. Therefore any under-remuneration is unlikely to have a major impact on outcomes.

A simple regression using just Ofgem’s three data points for Year 5 growth suggests that HAL would get the 54<sup>th</sup> percentile and Gatwick would get the 58<sup>th</sup> percentile. There is at least a correlation between the intensity and extent of RAB growth in the electricity and gas transmission sectors and the determined WACC percentile. However this has not been the case for CAA. We suggest that this percentile should be revised down given the plateauing of asset bases at the two airports.

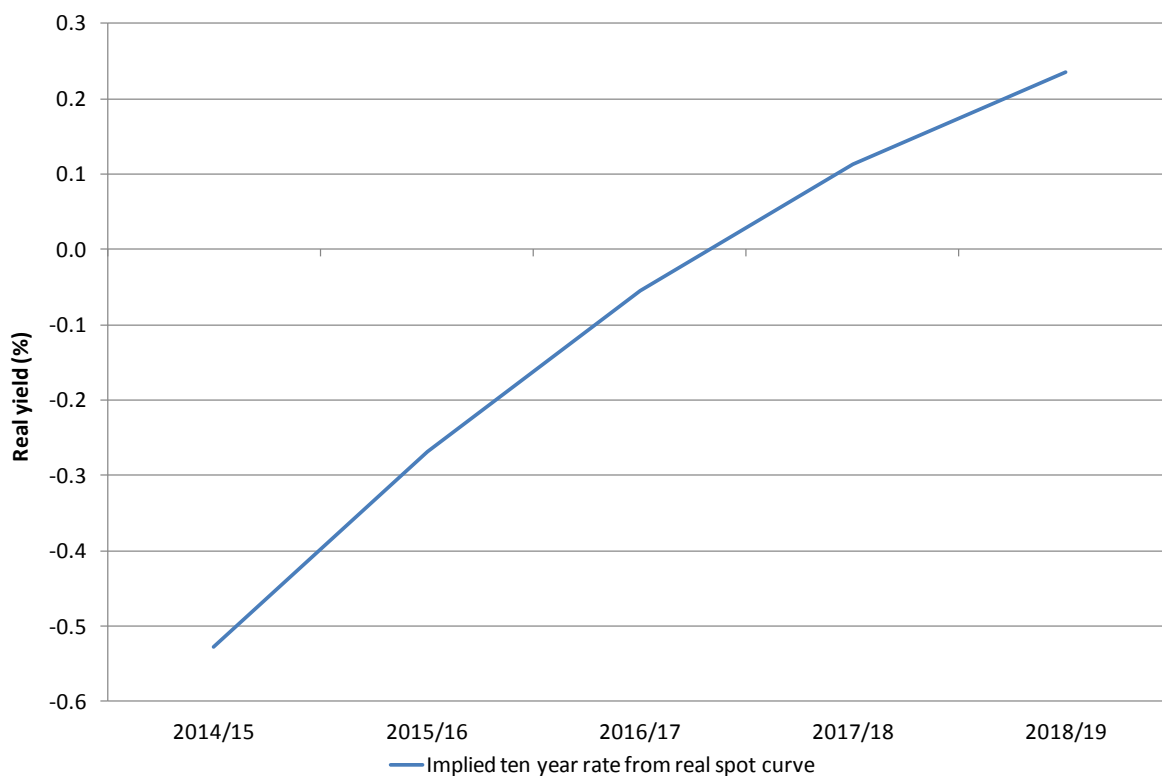
It would seem reasonable to assume that the social costs from underinvestment in energy networks would be more grave than in the airport sector. Airports do not command sole control over an essential service in the same way as an energy network does. Furthermore, the RAB growth of the airports is similar to the gas distribution industry. Therefore the CAA’s choice of a percentile above the 58<sup>th</sup> percentile for gas distribution does not appear justified. Reducing the uplift to the 58<sup>th</sup> percentile in each sector would save consumers £251m over five years, and even this is likely highly conservative.

### Headroom within the range estimate

This section considers the implicit headroom and explicit headroom allowed by the CAA in their Initial Proposals for Q6, focussing upon Heathrow as the revenue impacts are much greater due to the relative RAB sizes, although parallels can be drawn as the parameters with implicit headroom are economy-wide and will be the same for the Gatwick case.

The UK ten year gilt yield can be thought of as a proxy for the domestic risk-free rate and Figure 1.3 below shows how this expectations from the end of May 2013 of the evolution over the course of Q6.

Figure 1.3: Implied ten year rate



Source: Bank of England, CEPA analysis

The forward curve at the last available data point from Bank of England data (at the end of May 2013) for the ten year gilt rates implies that the risk-free rate over the five-year period will be -0.10%. This is what the markets are saying is the base case, with movements possible in either direction. This can therefore be thought of as the ‘no headroom’ case. Given that yields on ten year bonds increased in the first half of June, we have added 35bps to this figure for each year, giving an average risk-free rate of +0.25%.

Applying the forward rates to the overall cost of debt index can indicate what the overall cost of debt may be across Q6. We use the same indices as contained within the Ofgem cost of debt model, namely the ten year plus broad A and BBB non-financial corporates, and assume that the debt premium remains fixed at its current (elevated) spot rate (c.220bps), whilst the underlying risk free rate changes as above. Even with the significant debt premium, the rate average for embedded and new debt combined is below the mid-point of the PwC cost of debt range.

Figure 1.4: Cost of debt indices on a forward-looking basis



Source: Markit iBoxx, Bank of England, CEPA

This shows that the cost of debt over the Q6 period with no additional headroom included would be 2.51%. For the mid-point of the cost of debt range, there would be an implicit headroom of 14 bps.

Using this analysis, we can estimate how much headroom is allowed by the CAA from using the 80<sup>th</sup> percentile for Heathrow and what the corresponding cost of capital would be using the mid-point of the range. This analysis keeps the ERP constant at 6.0%, as per PwC’s analysis and we have used the mid-point of the equity beta range for the no headroom case.

Table 1.5: Headroom in the Cost of Capital for Heathrow using PwC analysis

	No headroom (i)	Mid-point of range	80 <sup>th</sup> percentile
Risk-free rate	0.25%	0.50%	0.65%
Cost of Debt	2.51%	2.65%	2.86%
ERP	6.0%	6.0%	6.0%

	No headroom (i)	Mid-point of range	80 <sup>th</sup> percentile
Equity beta	1.03	1.03	1.10
Pre-tax CoE	7.58%	8.33%	9.09%
Tax rate	20.2%	20.2%	20.2%
Gearing	60%	60%	60%
Pre-tax WACC	4.71%	4.92%	5.35%
<b>Headroom</b>		<b>+21 bps</b>	<b>+64 bps</b>

Source: CEPA, CAA

It should be noted that the cost of debt estimate is based upon the broad BBB and broad A rated ten year plus bond indices. This is discussed further within our cost of debt indexation note, but we believe that this estimate contains headroom given that the average life of debt is c.19 years. Comparing to an average of the Bloomberg ten year A and BBB rates suggests implicit headroom of over 30 bps.

The CEPA February 2013 report sets out why we would favour a rate of 5.0% for the ERP and that the equity beta for Heathrow should be in the in the range of 0.90-1.00. We use a 5.0% ERP and 0.90 equity beta in the no headroom case below, taking off 30 bps from the cost of debt for the implicit headroom by using longer maturity debt.

Table 1.6: Headroom in the Cost of Capital for Heathrow (w/ adjusted ERP, cost of debt and equity beta)

	No headroom (ii)	Mid-point of range	80 <sup>th</sup> percentile
Risk-free rate	0.25%	0.50%	0.65%
Cost of Debt	2.21%	2.65%	2.86%
ERP	5.0%	6.0%	6.0%
Equity beta	0.90	1.03	1.10
Pre-tax CoE	5.83%	8.33%	9.09%
Tax rate	20.2%	20.2%	20.2%
Gearing	60%	60%	60%
Pre-tax WACC	3.71%	4.92%	5.35%
<b>Headroom</b>		<b>+121 bps</b>	<b>+164 bps</b>

Source: CEPA, CAA

Comparing the adjusted no headroom case to the 80<sup>th</sup> percentile case, there is headroom of 164 bps. This would be equivalent to almost one third of the allowed cost of capital. The revenue impact of this is shown in the table below.



Table 1.7: Impact of high percentile choice, for Heathrow £m 2011/12 prices

	Return	2014/15	2015/16	2016/17	2017/18	2018/19	Total
Average RAB		13,720	13,763	13,755	13,677	13,525	68,440
80 <sup>th</sup> percentile return	5.35%	734	736	736	732	724	3,662
<b>Returns</b>							
50 <sup>th</sup> percentile	4.92%	675	677	676	672	665	3,367
No headroom (i)	4.71%	646	648	648	644	637	3,224
No headroom (ii)	3.71%	509	511	510	507	502	2,539
<b>Difference to 80<sup>th</sup> percentile</b>							
50 <sup>th</sup> percentile	-43 bps	-59	-59	-59	-59	-58	-294
No headroom (i)	-64 bps	-88	-88	-88	-88	-87	-438
No headroom (ii)	-164 bps	-225	-226	-226	-224	-222	-1,122

Source: CEPA, CAA

This analysis reiterates the large degree of headroom included within the cost of capital allowance, with estimates of the cost to consumers over the five year period of £294m in the 50<sup>th</sup> percentile case, £438m compared to a case with no headroom and £1,122m when comparing to a no headroom case adjusted for the ERP, equity beta and the maturity of the cost of debt index used. This will be similar for Gatwick, although the RAB is smaller, therefore the revenue impacts will be of smaller magnitude.

## Conclusion

The CAA has set the WACC at values at points high within their ranges. We consider these uplifts to be arbitrary, and not justified based on RAB growth. The analysis conducted in the previous section shows the significant cost impacts of using headroom within the cost of capital point estimate.

While the CAA proposes the repeat application of percentile uplifts set in the context of Q6's rapid RAB growth, the industry has reached a plateau of near negligible growth or even shrinkage. Therefore we propose that in the absence of better evidence on this topic, that the CAA should select the midpoint in their accepted ranges.

## Annex 1: Comparison of CAA range to CEPA range

Table A.1: Heathrow

	PwC range	CAA choice implied by 80 <sup>th</sup> percentile	CEPA range (Feb 2013)	Percentile of CAA initial choice in CEPA range	Comment
Gearing (%)	60	60	60	-	
Pre-tax cost of debt (%)	2.3 - 3.0	2.86	2.5 - 3.0	72 <sup>nd</sup>	
Risk-free rate (%)	0.25 - 0.75	0.65	1.5 - 1.75	-	Not comparable in isolation
Equity risk premium (%)	6.0	6.0	5.0	-	Not comparable in isolation
Equity beta	0.9 - 1.15	1.1	0.9 - 1.1	100 <sup>th</sup>	
Post tax cost of equity (%)	5.65 - 7.65	7.25	6.0 - 7.25	100 <sup>th</sup>	
Tax rate (%)	20.2	20.2	21	-	
Pre-tax cost of equity (%)	7.08 - 9.59	9.09	7.59 - 9.18	94 <sup>th</sup>	
Pre-tax WACC range (%)	4.21 - 5.63	5.35	4.5 - 5.5	85 <sup>th</sup>	

Table A.2: Gatwick

	PwC range	CAA choice implied by 75 <sup>th</sup> percentile	CEPA range (Feb 2013)	Percentile of CAA initial choice in CEPA range	Comment
Gearing (%)	55	55	60	-	
Pre-tax cost of debt (%)	2.35 - 3.05	2.87	2.5 - 3.0	74 <sup>th</sup>	
Risk-free rate (%)	0.25 - 0.75	0.62	1.5 - 1.75	-	Not comparable in isolation
Equity risk premium (%)	6.0	6.0	5.0	-	Not comparable in isolation
Equity beta	0.9 – 1.17	1.10	0.9 - 1.1	101 <sup>st</sup>	
Post tax cost of equity (%)	5.65 – 7.75	7.21%	6.0 - 7.25	97 <sup>th</sup>	
Tax rate (%)	20.2	20.2	21	-	
Pre-tax cost of equity (%)	7.08 – 9.71	9.04%	7.59 - 9.18	91 <sup>st</sup>	
<b>Pre-tax WACC range (%)</b>	<b>4.48 – 6.05</b>	<b>5.65%</b>	<b>4.5 - 5.5</b>	<b>115<sup>th</sup></b>	

Table A.3: Difference table

Sample	Heathrow	Gatwick
CEPA (Feb 2013) midpoint	5.00	5.00
Use of PwC range midpoint	-22bp	+27bp
Difference from adding percentile uplift	+57bp	+38bp
CAA Initial Proposals	5.35	5.65

Table A.4: Alternative difference table

Sample	Heathrow	Gatwick
CEPA (Feb 2013) midpoint	5.00	5.00
Difference from adding percentile uplift	+30bp	+25bp
Use of PwC range	+5bp	+40bp
CAA Initial Proposals	5.35	5.65