SETTING THE WEIGHTED AVERAGE COST OF CAPITAL FOR BAA IN Q5

July 2006

Prepared by:

Cambridge Economic Policy Associates Ltd.

CAMBRIDGE ECONOMIC POLICY ASSOCIATES

July 2006

CONTENTS

July 2006

IMPORTANT NOTICE

This report has been commissioned by British Airways. However, the views expressed are those of CEPA alone. CEPA accepts no liability for use of this report or any information contained therein by any third party.

July 2006

ABBREVIATIONS AND ACRONYMS

BAA	BAA plc
B	Equity beta
Bp	Basis points
CAA	Civil Aviation Authority
Capex	Capital expenditure
CAPM	Capital asset pricing model
CC	Competition Commission
CoC	Cost of capital
CoD	Cost of debt
CoE	Cost of equity
DGM	Dividend growth model
DP	Debt premium
EBITDA	Earnings before interest, tax, depreciation and amortization
ERP	Equity risk premium
FFO	Funds from operations
G	Gearing ratio
GAL	Gatwick airport
G2	Stansted 2nd runway
HAL	Heathrow airport
MR	Market asset ratio
n/a	Not applicable
NPV	Net present value
NTS	Net of tax shield
Q4	London airports price control period 2003 - 2008
Q5	London airports price control period 2008 - 2013
Q6	London airports price control period 2013 - 2018
RAB	Regulated asset base
STAL	Stansted airport
WACC	Weighted average cost of capital

1. INTRODUCTION

This paper has been prepared by Cambridge Economic Policy Associates ('CEPA') in response to the CAA's request for comments on the issues raised in the 15th May Policy Update Document[1]. In particular, it provides views on how CAA should approach the determination of an appropriate allowed WACC for BAA in Q5.

The paper sets out:

- CEPA's assessment of the appropriate allowed weighted average cost of capital (WACC) for BAA in the Q5 regulatory price control period and provides the key arguments in support of our view.
- Identifies the differences between our assessment and the values used by CAA and CC in the Q4 review and explains the reasons for them.

The structure of the paper is as follows:

- Section 2 is the Executive Summary.
- Section 3 provides a brief discussion of the definitions of weighted average cost of capital and a summary of the CAA's approach to setting BAA's allowed cost of capital in Q4.
- Section 4 sets out our recommended approach to determining the allowed WACC and our assessment of the appropriate range of values for the key input variables with supporting evidence.
- Section 5 provides our assessment of the appropriate WACC in Q5 at a corporate level[2].
- Section 6 provides comments on issues raised in the CAA's recent policy update document[3].

There are five appendices which provide further evidence and analysis to support the arguments in the main paper.

Our analysis assumes that CAA will make a robust assessment of other aspects of the revenue determination, and that there are no material shifts in the allocation of risk between users (airlines) and BAA compared to Q4.

[1] CAA (2006a).

[2] This paper considers BAA's WACC for Q5 at the corporate level. We do not provide separate estimates of the WACC for each airport in this report. Section 6.2 discusses some general issues in relation to defining the standalone cost of capital for each airport in the current situation.

[3] CAA (2006a).

2. EXECUTIVE SUMMARY

2.1. BAA's WACC for Q5[4]

Our approach to determining BAA's WACC is as follows.

In common with most UK regulators, we recognise that although CAPM has its limitations it remains an appropriate framework within which to assess the cost of equity. However, given the legitimate critiques of CAPM, our approach is to assess the cost of equity of BAA using a number of additional approaches and sources of information. These additional approaches include: (i) the market capitalisation / RAB (MR) ratio; (ii) the dividend growth model (DGM); (iii) estimates by other regulators since the Q4 review was completed; and (iv) evidence from the financial markets.

The correct way to determine BAA's cost of debt is to assess the risk free rate and the debt premium expected to be payable over the Q5 period by an efficient business with comparable regulatory and business risks. The cost of debt should be estimated assuming that the business had adopted 'optimal' gearing. We discuss the reasons for this in detail in Section 4.

2.1.1. Cost of debt

In our view, the cost of debt of BAA's regulated UK airport businesses over Q5, lies in the range 3-3.75%, with a most likely value equal to the mid-point of the range, i.e. 3.375%. This reflects the following judgements:

- That a conservative range for the risk free rate is 2 – 2.5%. The mid-point of this range is close to the 10 year average risk free rate of 2.3%, and assumes a significant increase in risk free rates over Q5.
- That the debt premium over the Q5 period, based on an optimally geared regulated business with a solid investment grade rating, lies within the range 1-1.25%. Again this is conservative, since the mid point of the range assumes an increase in the debt premium from current levels.

We discuss below and in Section 6 the possibility of introducing automatic triggers to the cost of debt, which would allow CAA to use the lower end of this range without putting at risk the ability of BAA to raise debt to finance its investment programme.

2.1.2. Cost of Equity

Our assessment of the post-tax cost of equity of BAA's regulated UK airports business in Q5 assumes that the business has a net debt/RAB ratio in the range 50-60%. Our estimate of the cost of equity is 6.0-7.25%. The rationale and supporting evidence is set out in Section 4.3.

[4] Much of Section 2.1 is repeated in Section 5 of the report, although with more detail.

Our estimate takes account of all of the available evidence, rather than relying solely on CAPM. As a result:

- The low end of the range is above the mid-point of the CAPM-derived range.
- The high end of the range is set at the top end of the CAPM-derived range.

CAA can be confident that in using the mid-point of this range (6.625%) BAA can, if necessary, finance its capital expenditure programme in part by raising new equity as well as debt. No further adjustments are necessary to this mid-point.

2.1.3. Gearing

We believe that that the use of estimated optimal gearing when determining the allowed WACC is conceptually correct. In addition, we note that that the approach has now been adopted by most regulators and is in line with the CAA's policy to set price caps according to regulatory fundamentals (rather than to accommodate any particular financing strategy adopted by BAA's old or new owners).

Taking account of the business and regulatory risks of the regulated UK airport businesses our judgement is that the appropriate optimal gearing range is 50-60% net debt/RAB. We believe that if net debt/RAB of the regulated businesses were maintained in this range in Q5 then the regulated businesses - if efficiently operated – would retain a solid investment grade rating.

2.1.4. Taxation

We are strongly of the view that the CAA should set allowed revenues sufficient to fund its best estimate of the post-tax vanilla WACC and allow additional revenues sufficient to fund expected actual taxation payments over the Q5 period. This approach is used by both Ofwat and Ofgem. We believe that it is the correct approach for CAA, and is fully consistent with its recent statements. This issue is discussed in detailed in Section 4.4.

2.1.5. BAA's overall WACC for Q5

Post-tax vanilla WACC

CEPA's assessment of BAA's post-tax vanilla WACC in Q5 is set out in Figure 2.1 below. The post-tax vanilla WACC range is 4.2- 5.5% with a most likely[5] value of 4.8%. Section 5 discusses the differences between this estimate and the CAA Q4 mid-point. Key points to note are as follows:

- Our most likely cost of equity of 6.625% is significantly higher than the Q4 determination central value adjusted for uplifts of 6.38%. This difference takes account of a lower risk free rate, and the higher expected gearing compared with 2006/07.

[5] We refer to our point WACC estimates as 'most likely' rather than central since, as illustrated in Figure 2.3 they are not necessarily central estimates of the parameter values, particularly in relation to CAPM where we truncate the lower values.

- Our most likely estimate of the pre-tax cost of debt is lower than the value used by CAA in Q4 – but as we have noted, we believe that it is conservative. In addition, we believe that there are good reasons why CAA should use the lower end of our cost of debt range and protect BAA against unexpected sharp increases in the actual cost of debt by including automatic adjustments in the event that the actual cost of debt rises significantly above this level.
- Given the above, a significant proportion of the difference between our estimate of the post-tax vanilla WACC for Q5 and CAA's Q4 estimate is the result of the higher gearing assumption of 55% used in the central case, compared to the gearing used by CAA in Q4 of 25%.

Figure 2.1: CEPA Assessment of BAA's Post-tax Vanilla WACC for Q5

	Low (%)	Most Likely (%)	High (%)
Post-tax Cost of Equity	**6.0**	**6.625**	**7.25**
Pre-tax Cost of Debt	**3.0**	**3.375**	**3.75**
Gearing	60	55	50
Post-tax vanilla WACC	**4.2**	**4.8**	**5.5**

Pre-tax WACC (No automatic adjustments case)

We believe that CAA should set allowed revenues based on the post-tax vanilla WACC (assuming 'optimal' gearing) and then allow additional revenues to fund expected actual taxation costs. Our expectation is that the effective tax rate of BAA's regulated businesses will be considerably lower than 30%. We have therefore illustrated the case where the effective tax rate is assumed to be 20%. Figure 5.2 sets out the pre-tax WACC range that corresponds to our post-tax vanilla WACC range, assuming the effective corporate tax rate is 20%.

The pre-tax WACC range is 4.8 - 6.4% with a central value of 5.6%. Section 5 provides a comparison of these estimates with CAA's approach in Q4.

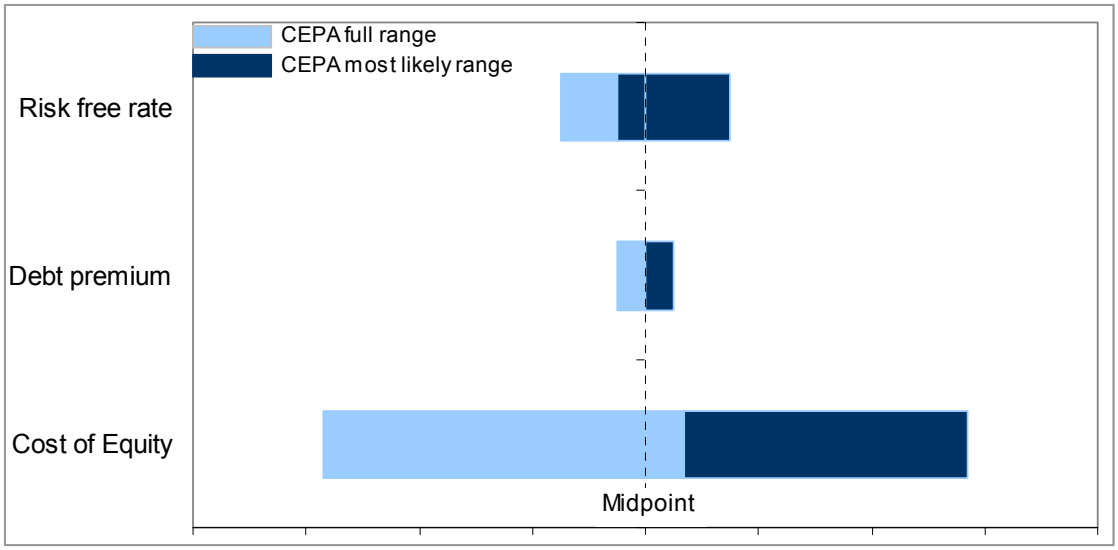
In forming a view of the robustness of these 'most likely' estimates it is important to recognise that the ranges that we have used for the key parameter values here are conservative. In particular, as shown in Figure 2.3, our range of estimates for the cost of equity already rejects the lower end of the range of values derived from CAPM. The same is true of our estimate of the risk free rate – where the low end of our range is well above current rates.

It is therefore inappropriate to make any further upward adjustments to these 'most likely' values. It is our firm view that, in the absence of automatic adjustment mechanisms for the cost of debt, the appropriate WACC values are those in the 'most likely' column.

Figure 2.2: CEPA Assessment of BAA's WACC in Q5

	Low (%)	Most likely (%)	High (%)
Gearing	60	55	50
Post-tax vanilla WACC	**4.2**	**4.8**	**5.5**
Pre-tax WACC (t=20%)	**4.8**	**5.6**	**6.4**

Figure 2.3: CEPA most likely range of WACC inputs



2.2. Summary of comments on CAA Policy Update and other issues

2.2.1. Automatic adjustment to the real costs of debt

In the final section of this paper we consider the possibility of introducing mechanistic triggers on the real cost of debt as a way of reducing the costs to airport users without putting at risk the ability of BAA to finance its investment. Although there are further issues to be considered in designing such a trigger, we believe that CAA should give the idea serious consideration.

Pre-tax WACC (No automatic adjustments case)

Figure 2.4 provides our assessment of the appropriate allowed WACC in the event that CAA decides to include such automatic adjustment mechanisms along the lines discussed in Section 6. The only difference compared with estimates above in Figure 2.2 is the use of the low end of the range of the cost of debt values (i.e. a risk free rate of 2% and a debt premium of 1%).

Figure 2.4: BAA's WACC in Q5

	%
Cost of Debt	3.0
Post-tax of equity	6.625
Gearing (debt/RAB)	55
Post-tax vanilla WACC	**4.6**
Pre-tax WACC (t=20%)	**5.4**

2.2.2. Issues raised by BAA

Section 6 also discusses two issues raised by BAA in their response to the CAA December consultation paper: (i) whether the CAA is tied to using a WACC of 7.75%; and (ii) the setting of differential WACCs for the three London airports.

- On the first issue we are clear there is absolutely no such obligation, and believe that the markets are fully aware that this is the case.
- On the second, we believe that CAA are right to consider the benefits of corporate financing, for so long as there is not full ring-fencing of each of the regulated businesses.

3. WEIGHTED AVERAGE COST OF CAPITAL

3.1. Introduction

In this section we set out some background to our analysis of BAA's WACC in Q5. This includes a general discussion of the concepts and definitions of the weighted average cost of capital (WACC) and a description of the approach adopted by CAA when setting the WACC in Q4.

3.2. General

CAA is required to set maximum allowed revenues for BAA so as to comply with its statutory duties. In summary, these are[6]:

- to promote the efficient, economic and profitable operation of the UK airports;
- to further the reasonable interests of airport users within the UK;
- to encourage investment in the facilities at airports in time to satisfy anticipated demands by the users; and
- to impose minimum restrictions.

Although each price control period (quinquennium) is five years, the CAA must not only set maximum prices for the next five years at the appropriate level, but it must also take into account the financial markets' perceptions of the regulatory and business risks over the full life of the assets. In particular, a key concern of providers of equity and long-term debt will be the regulatory risk associated with future periodic reviews of maximum prices.

The 'correct' maximum price trajectory will recover over the full life of the assets:

- The operating costs necessarily incurred by an efficient and economic operator. The usual assumption is that the operator should achieve sustained trend improvement in operating efficiency over time. The annual percentage improvement in unit operating costs is linked to how close to the 'efficiency frontier' the operator currently is judged to be.
- The depreciation charge reflecting the amount of capital expenditure incurred and to be incurred and the economic lives of the assets. The profiling of 'regulatory' depreciation has a very significant impact on the profiling of maximum prices and of BAA's net cash flow over time.
- The tax payable in each year by the business over the full life of the assets. Any 'gap' between actual taxation costs and the revenues allowed to fund taxation costs has a significant impact on the maximum price trajectory, on net cash flow over time and on the achieved post-tax return on capital over the quinquennium and over the full life of the assets.

[6] CAA (2006b).

- The cost of debt which is the gross interest on debt payable by an efficiently financed BAA.
- The post-tax cost of equity which is the net profit accruing to BAA's shareholders which may be distributed as dividends or retained and reinvested in the business.

When setting the allowed WACC in Q5, CAA will have to form judgements about all these components of the maximum price calculation. The return on capital employed is one important component of allowed revenue.

3.3. What is the Weighted Average Cost of Capital?

Any business will finance itself using a combination of equity and debt (or 'hybrid' securities, such as convertible debt, which have some of the characteristics of debt and some of equity). Conceptually, the cost of equity is the expected return that must be offered to providers of equity if they are to acquire or hold share capital in the regulated business. The cost of debt is similarly the expected return required by providers of debt to the regulated businesses.

The cost of equity and debt are determined in the financial markets and are equal to the rate of return expected to be available from alternative opportunities with comparable risk. It follows that if the allowed cost of equity and debt are set at the 'correct' level then a business will always be able to raise finance to invest in new facilities so long as the new capital expenditure is included in the RAB.

The weighted average cost of capital (WACC) is the average of the cost of equity and debt, weighted by the proportions of equity and debt which an efficiently financed company can be expected to use to fund its activities. Hence to determine the WACC, it is necessary to determine the cost of debt and the cost of equity and the proportions of debt and equity that would be employed by an efficiently financed company.

Providers of equity and debt capital are concerned with the post-tax returns available to them. Hence when setting maximum prices the regulator must allow not only for the post-tax WACC to be earned but also must allow for corporate taxation costs that will be incurred by the regulated businesses. Since for corporation tax assessment the tax treatment of interest on debt (deductible as a cost) is different to the tax treatment of net profit (not deductible for tax purposes), the allowed revenues to fund taxation costs will be a function of the proportions of debt and equity that would be employed by an efficiently financed business. Later, in section 3.4, we consider how to adjust the WACC/maximum prices for taxation costs.

In price regulated businesses, in addition to determining the 'correct' WACC the regulator must also set the 'correct' capital base to which the WACC is applied. The so-called Regulatory Asset Base (RAB) is the value of capital employed in the regulated part of the business on which the WACC must be earned if the business is to be able to finance the regulated business.

The relevant WACC is the cost of capital of those assets that are subject to the price controls. Where the regulated business is owned by a larger group the WACC of the group may not be representative of the WACC of the relevant assets.

3.4. Definitions of the Weighted Average Cost of Capital

There are a number of different definitions of the WACC. Here we define three: the post-tax 'vanilla' WACC; the pre-tax WACC; and the post-tax net of debt tax shield WACC. Different definitions are used by different regulators and care is needed to ensure that like is being compared with like and that taxation cost adjustments are appropriate to the chosen definition. The value of the WACC differs depending on the definition used as does the way taxation costs are allowed for.

3.4.1. Post-tax 'Vanilla' WACC

A common formulation of the WACC is:

$$\text{Post-tax vanilla WACC} = r_e \frac{E}{V} + r_d \frac{D}{V}$$

where r_e is the post-tax cost of equity (i.e. equals the after tax rate of return available on alternative equity investments of comparable risk)

r_d is the gross cost of debt (i.e. the sum of the risk free rate and the corporate debt premium available to debt providers for alternative debt opportunities of comparable risk)

D is the value of the firm's debt

E is the value of the firm's equity

V is the sum of $D+E$[7]

The post-tax vanilla WACC is the return available to providers of debt and equity capital after company tax payments have been accounted for. If allowed revenues to fund the return on capital are set using the post-tax vanilla WACC, the expected taxation costs should be separately and additionally allowed for when setting maximum prices. This post-tax vanilla WACC is the formulation used by, for example, Ofwat and (since 2004) Ofgem.

Appendix 1 provides some further technical details on definitions of the WACC, including worked examples.

For reasons set out later in this report, we believe that the CAA should adopt the post-tax vanilla WACC approach and separately estimate an additional allowance for BAA's expected taxation costs.

[7] The theory states that D and E should be market values. In practice book values are often used. For the regulated business (D+E) = RAB.

3.4.2. Pre-tax WACC

Some regulators (including CAA in Q4) use a pre-tax WACC. The pre-tax approach 'grosses-up' the post-tax vanilla WACC to an equivalent pre-tax WACC.

$$\text{Pre-tax WACC} = \frac{r_e}{(1-t)} \cdot \frac{E}{V} + r_d \frac{D}{V}$$

where t = statutory company tax rate

and all other terms are as in the post-tax vanilla WACC formula above.

The pre-tax WACC approach implicitly assumes that the effective tax rate on pre-tax profit is equal to the statutory company tax rate. If allowed revenues to fund the return on capital are set using the post-tax WACC, no further revenue should be allowed to fund taxation costs because the 'grossing-up' has already allowed a notional amount to fund taxation costs and any additional allowance would be double-counting. This pre-tax WACC is the formulation used by CAA in Q4 and, for example, by Ofgem in 1999 (not, however, since 2004).

The 'grossing-up' by *(1-t)* of the post-tax return on equity will *only* give the same post-tax rate of return as using the post-tax vanilla WACC and separately allowing for taxation costs *if* the effective tax rate equals the statutory tax rate. If the effective tax rate is lower than the statutory rate allowed, revenues will overcompensate the company and the actual post-tax WACC will be higher than the allowed WACC.

In practice, because of differences in timing between capital allowances for tax purposes and depreciation allowed in the statutory and regulatory accounts, the effective company tax rate is often significantly lower than the statutory rate. This is true of BAA, particularly during the current period of heavy T5 capital expenditure and the continuing period of heavy investment in Q5 anticipated by BAA. Therefore use by CAA of the pre-tax WACC approach and the statutory tax rate would significantly over-compensate BAA in Q5, resulting in achieved returns exceeding the 'allowed' cost of capital.

3.4.3. Post-tax net of debt tax shield WACC

This alternative formulation of the post-tax WACC, called the net of debt tax shield WACC, is defined as:

$$\text{Post-tax WACC Net of Debt Tax Shield} = r_e \frac{E}{V} + r_d (1-t) \frac{D}{V}$$

This differs from the post-tax vanilla WACC in that it adjusts the gross cost of debt directly to a post-tax cost of debt by directly taking account of the tax deductibility of interest. This formulation is appropriate *only if* the regulator makes no further allowance for the tax deductibility of interest when calculating the allowance for taxation costs (i.e. allowed revenue to fund taxation costs should be calculated as if the company were 100% equity funded). This formulation is included here primarily because some city

analysts use this definition when setting out their views of the appropriate value of the WACC. If the allowance for taxation costs is correctly made (i.e. as if it were an all equity financed business) and if but only if the effective rate of tax equals the statutory rate then this definition – although giving a different 'headline' allowed WACC – will provide the company with the same allowed revenue as the other definitions of WACC. This point is illustrated in Appendix 1.

3.5. CAA Approach in Q4

The process for setting the price caps, as set out in the Airports Act (1986), involves the CAA referring the regulated airports to the Competition Commission every five years. The Competition Commission then makes recommendations on what the maximum airport charges should be over the next five years and whether the regulated airports have been acting against the public interest.

We summarise here our understanding of the approach that CAA took to determining the cost of capital following the Competition Commission's ('CC') recommendations in the last quinquennial review Q4. As already noted above, CAA used a pre-tax WACC approach.

Although both the CAA and the Competition Commission focused on CAPM as the best approach for determining the cost of capital, there were significant differences between: the approach suggested by the CAA as part of its referral; the Competition Commission's recommendations; and the final CAA determination. The key differences were as follows:

- The Competition Commission's estimates of the cost of capital were made for BAA as a whole, rather than for individual airports.
- The Competition Commission did not make any distinction between new and existing assets (as suggested by CAA in its initial proposals)
- Unlike the CAA's initial referral, the Competition Commission only considered the cost of capital under a single till approach to regulating the London airports.

In their final determination, the approach used by the CAA in setting the allowed cost of capital was to set out a range of estimates for all of the inputs to the weighted average cost of capital (WACC), to take the midpoint of the resulting range of estimates and make several adjustments to take account of a number of 'special features' which they allowed for by adding WACC uplifts to derive their overall estimate of BAA's WACC.

Figure 3.1 below sets out the range of WACC estimates calculated by CAA as well as the adjustments made to reach the final pre-tax real WACC. Key points to note are:

- **The risk-free rate.** The range used by the CC / CAA was 2.5% - 2.75%. This was lower than the value used by the CC in the then-recent water enquiries[8], and reflected the downward trend in the assumed risk free rate.
- **The equity risk premium.** The CAA and CC referred to evidence from both past returns (looking at alternative periods and alternative approaches to averaging the estimates) and investor surveys. In the light of this analysis, and taking account of the submissions received, they used a range of 2.5% to 4.5% for ERP. The mid-point of the range (of 3.5%) was lower than then recent CC decisions – which had mid-points of 4% and 4.25%[9].
- **Beta**: CAA and CC used a range of estimates for the equity beta between 0.8 and 1.0. This range was higher than the observed equity betas at the time, although not higher than the 5 year average. The CAA noted that their judgement was that the beta range should be close to the value of the equity market as a whole (i.e. 1.0).
- **Cost of Debt**. CAA and CC used a range of 90 to 120 basis points over the risk free rate reflecting the low debt/capital employed ratio (25%) and the actual BAA cost of borrowing at the time.
- **Capital structure**. CAA used actual gearing at the time (25%) rather than either projected or optimal gearing. They argued that the weighted average cost of capital would not be much affected by a higher gearing assumption.
- **Tax rate**. CAA used the corporate tax rate (30%) to derive the pre-tax WACC rather than an estimated effective rate – and accepted that this gave BAA additional headroom.

Figure 3.1 shows that the mid-point of CAA's range of WACC values was 7.21%[10]. In addition to rounding up to the nearest quarter, CAA made two further adjustments to this value. The first was an ERP smoothing adjustment of 0.25% added to the WACC to take account of uncertainty around the correct value of ERP. The second adjustment, a further 0.25% uplift to the WACC, was intended to take account of the risk and costs of T5. The CAA pointed to the following four special factors:

- The price control proposals included a 'trigger mechanism' which linked airport charge increases to achievement of milestones.
- The loss of the real options value of building T5 earlier than planned.

[8] The CC used a risk free rate of 3% in its Mid Kent Water (2000) and Sutton & East Surrey Water (2000) determinations.

[9] The CC used an ERP of 4% in its Mid Kent Water (2000) and Sutton & East Surrey Water (2000) determinations and 4.25% in Cellnet-Vodafone (1999)

[10] 7.21% is the midpoint of the pre-tax WACC range. The actual mid-point using the mid-points of the parameter values is 7.11%

- The increased borrowing for T5 which was expected to push up gearing – and therefore increase non-diversifiable risk, and push up debt premiums. CC also noted that a rights issue could have a cost to BAA.
- There was a risk that the expectations in the price control would not be met – which would increase BAA's risk.

Figure 3.1: CAA range of WACC parameter estimates used in Q4

Parameter	Low	High	CAA Determination
Risk free rate	2.50%	2.75%	
Equity risk premium	2.50%	4.50%	
Equity beta	0.80	1.00	
Post-tax CoE	**4.50%**	**7.25%**	
Taxation adjustment	30.00%	30.00%	
Pre-tax CoE	**6.43%**	**10.36%**	
Gearing	25.00%	25.00%	
Debt premium	0.90%	1.20%	
Pre-tax CoD	**3.40%**	**3.95%**	
Pre-tax WACC	**5.67%**	**8.76%**	**7.21%**
'ERP' Smoothing			**0.25%**
T5 Adjustment			**0.25%**
Pre-tax WACC (Decision)			**7.75%**

4. CEPA APPROACH AND ASSESSMENT OF INPUT VARIABLES

4.1. Determining the WACC - General

To determine the allowed revenues relating to the WACC we need to determine:

- the *cost of debt* for the regulated business over the Q5 period;
- the *cost of equity* for the regulated business over the Q5 period;
- the appropriate *debt: RAB ratio* for the regulated business over the Q5 period;
- the appropriate method to allow for *taxation costs* of the regulated business over the Q5 period; and
- the appropriate *Regulatory Asset Base (RAB)* over the Q5 period.

The Capital Asset Pricing Model (CAPM) is the framework used to estimate the cost of equity by almost all regulators[11]. It assumes that parameter values estimated from historic data are valid indicators of prospective values. The theoretical and practical limitations of CAPM are well known. It is a poor predictor of historic excess returns[12]. Parameter value estimates have high standard errors and the selection of 'most likely' values is subject to considerable uncertainty. Uncritical use of historic values often results in prospective cost of equity estimates that are implausible when regard is had to direct market evidence.

As a result, in common with most UK regulators, our approach is to assess the cost of equity of BAA using a number of additional approaches and sources of information as well as CAPM. These additional approaches include:

- the market capitalisation / RAB (MR) ratio;
- the dividend growth model (DGM);
- estimates by other regulators since the Q4 review was completed; and
- evidence from the financial markets.

The failure of CAPM to generate robust estimates of the cost of capital is highlighted by both Ofgem and Ofwat in their 2004 price control determinations.

'*In determining its cost of equity assumption for the final proposals Ofgem has had regard to traditional methods such as CAPM as well as wider market evidence, including data on the aggregate return on equity over time. As part of this review, Ofgem commissioned Smithers & Co to present a report on beta estimates for a range of companies in the electricity and water sectors*[13]*. Smithers & Co found strong evidence of parameter instability for several of the companies. This was problematic given that a fundamental assumption underlying the traditional CAPM approach is that beta remains stable over time.*'

[11] See Figure 13, page 43 of CEPA (2005), *An International Comparison of the Regulated Cost of Capital.*

[12] See Fama & French (1989).

[13] Smithers (2003).

'Given this background, Ofgem decided also to have regard to other methods in determining the appropriate cost of equity.'

Source: Ofgem (2004), pp105-6

'It is apparent that applying the CAPM framework on its own could produce a very wide range for the cost of capital. This arises principally because of an extended period of volatility in the capital markets worldwide and the impact of this on some of the components underlying CAPM, particularly the risk-free rate and equity beta factors. For example, currently beta factors for the listed water companies are around 0.4 – a significant decline since the last review. They were as low as 0.3 in 2002-03. This decline is likely to reflect wider market influences rather than a fundamental change in the business risk faced by the water companies. Another component of CAPM, the equity risk premium, has always been difficult to measure with any precision. In our methodology paper, we recognised that in assessing the cost of capital, it was possible that we would need to supplement a CAPM-based approach using current market data with other techniques and evidence.

'At the lower end of the range, the CAPM evidence appears to conflict with market reality, and we have discounted it. This is a similar approach to that taken by Ofgem, which in its March 2004 consultation document on its review of price controls for distribution network operators, proposed a cost of capital range of 4.2% to 5.0% on a post-tax basis. Ofgem's range excluded the bottom of a very wide range 'supported by the available data' of 3.0% to 5.0%.

'Such volatility in the capital markets means that, in our view, and in the view of our advisers, less reliance than at previous price reviews should be placed on the conventional methods of assessing the cost of equity such as CAPM.'

Source: Ofwat (2004) pp220-1

Nevertheless CAPM remains, as stated, the framework of choice of almost all regulators when determining the cost of capital.

In there response to the CAA's consultation document on cost of capital, BAA refers to the Fama-French three factor model as an alternative methodology for deriving the cost of capital. In this regard we note Ofgem's recently expressed view (Transmission Price Control Review: Initial Proposals 2006) that 'we have found no evidence to suggest that [the Fama and French model] adds materially to the robustness of the estimates derived through CAPM'. This is also our view.

In the remainder of this section we give our assessment of the appropriate range of values for the key WACC input variables together with supporting evidence.

4.2. The Cost of Debt

The correct cost of debt is the cost of borrowing that an efficiently operated and financed company with comparable systematic risks would incur in Q5. The cost of debt of the regulated business is a function of debt market conditions, the business and regulatory risks facing the regulated business and its gearing (debt: RAB ratio).

The correct way to determine BAA's cost of debt is to assess the risk free rate and the debt premium expected to be payable over the Q5 period by an efficient business with comparable regulatory and business risks. The cost of debt should be estimated assuming that the business had adopted 'optimal' gearing. In section 5.3 we make the case for using optimal gearing (rather than current or projected gearing) and judge the

optimal gearing for a company with BAA's business and regulatory risks to be in the range 50-60%.

4.2.1. The real risk free rate

The value of the real risk free rate (r_f) as measured by the return on long dated Sterling index-linked bonds has fallen sharply since 1999. Figure 3.1 shows that prior to 1998, r_f averaged more than 3% but in 1999 it fell sharply to about 2% and more recently has fallen further to a historically very low value of about 1.5%.

This significant reduction since 1999 has lowered the average risk free rate over the past 10 years to around 2.25% and the average since 1999 to 1.9%[14]. When determining the risk free rate for the Q5 period, the question is whether the observed lower real rates of the past 7 years will continue, or whether there will be a reversion to the longer run average value.

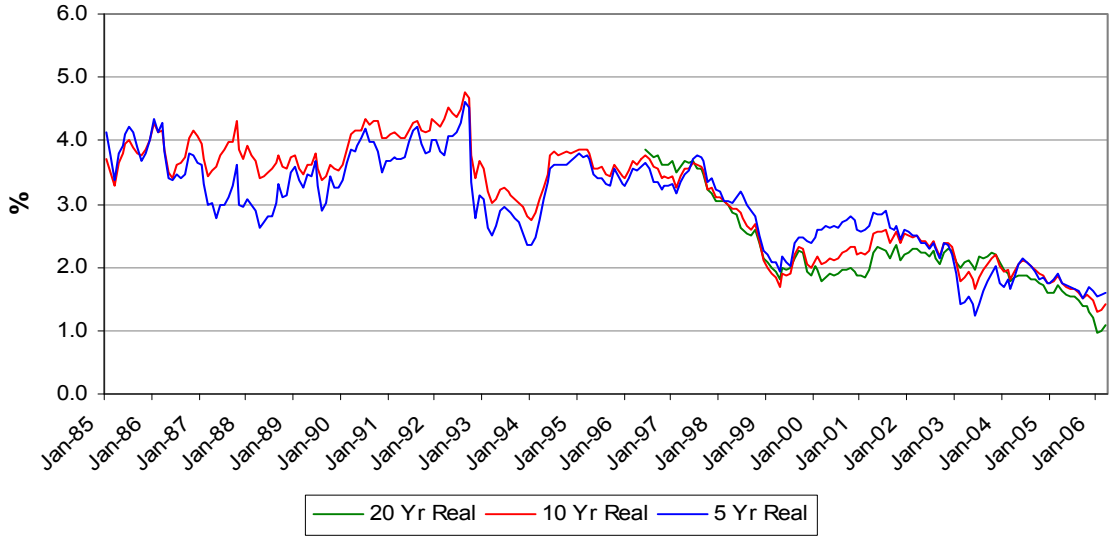
There has been much debate about the reasons for the decline in r_f and whether or not it is likely to be sustained over the medium term. To briefly summarise these:

- There are arguments in favour of the view that the lower risk free rate is related to global demographic shifts (the ageing of the population in rich countries) and related macro-economic shifts (a global surplus of savings which reduces risk free rates).
- Others argue that low world-wide risk free rates are caused by macro-economic imbalances induced by overly-relaxed monetary policy, e.g. in the US and Japan and that these are cyclical. They say that with cyclical correction there will be reversion to the longer-run mean, but when and to which mean value they cannot say.
- UK analysts note that UK risk free rates have fallen even further than elsewhere. They tend to focus on the local causes of particularly low values, seeing pensions as particularly important. The shift in favour of government bonds and away from equities by pension funds, stimulated in part by new pensions' legislation and accounting standards has reduced the risk free rate to abnormally low levels in the UK in recent years and brought about an inversion of the risk free yield curve.

Each of these arguments has merit. The judgement that regulators must make is what the cost of debt will average over the Q5 period. In the UK City opinion is that in the short term very low risk free rates are likely to remain but over the medium term some tightening can certainly not be ruled out. Very few analysts expect that the average risk free rate over Q5 will be as high as the longer-term historic average.

[14] Average values are calculated using the 20 year index-linked redemption yields. Using the 10 year index-linked redemption yields these numbers are 2.3% for the 10 year average and 2.1% for the average since 1999.

Figure 4.1: Real yields on index linked gilts



Source: Bank of England

Figure 4.2 sets out r_f assumptions by various regulators in recent determinations and Figure 4.3 shows how regulatory determinations compare with actual observed r_f values. It is apparent that since 1999 there has been a gradual reduction in regulators' assumed risk free rates but that regulatory determinations have remained higher than the actual risk free rate. The longer the lower risk free rates have persisted, the more confident regulators have become that they will continue in future, which has been reflected in a gradual reduction in the assumed risk free rate.

This trend has continued with the very recent Ofgem Transmission Price Control Review (TPCR) Initial Proposals, where Ofgem cites the lower 10-year average gilt yield of 2.3% when setting out its WACC reference value.

Figure 4.2: Recent regulators' assessments of the risk free rate

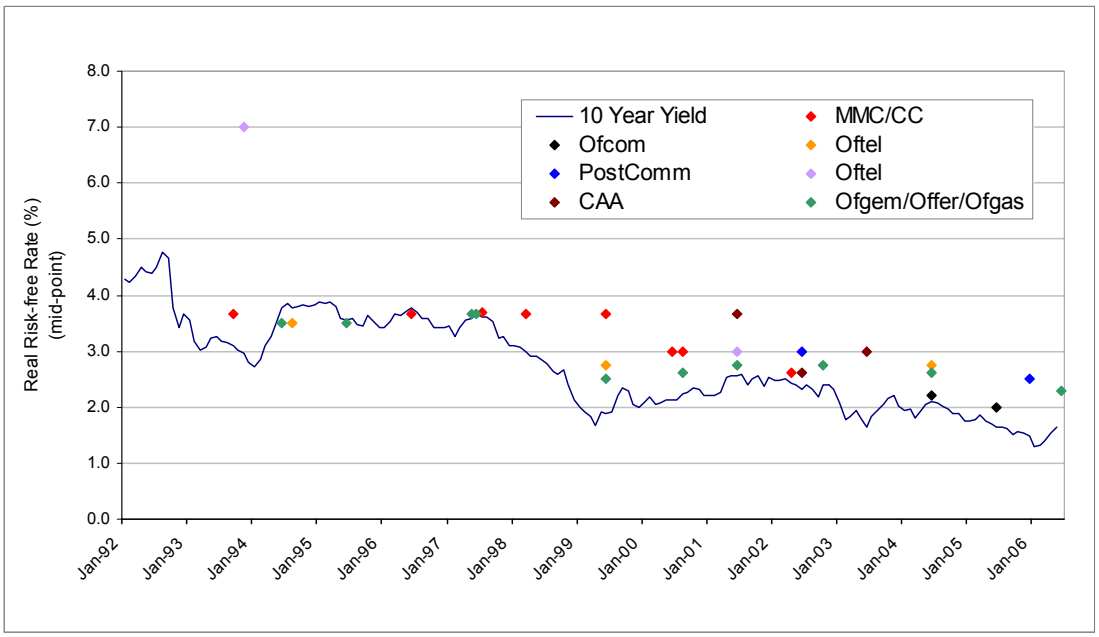
Regulator	**Case**	**Risk free rate (%)**
CAA	BAA (2003)	2.5-2.75*
CAA	NATS (2005)	2.5
Ofgem	TPCR (2006)**	2.3
Postcomm	Royal Mail (2005)	2.5
Ofcom	BT (2005)	2.0
Ofgem	DPCR (2004)	2.25-3.0
Ofwat	Water & sewerage (2004)	2.5-3.0
Ofcom	Mobile call termination (2004)	2.2

**Before addition of 'uplifts'*

*** Initial proposals*

Source: Regulatory determinations

Figure 4.3: Real Risk Free Rate and Regulatory Determinations



Source: Regulatory determinations and Bank of England[15]

Our assessment of the risk free rate in Q5 takes account of the following:

- It would be imprudent to assume that the current very low risk free rates (below 2%) will continue throughout Q5.
- If the risk free rate recovered somewhat (say to 2%) by the beginning of Q5 and then increased steadily over Q5 to 3% by the end of the Q5 period then the average rate over Q5 would be about 2.5%.
- The 10-year historic average risk free rate is about 2.25% (which is consistent with the figure of 2.3% used by Ofgem in its most recent assessment).

Our assessment of the average risk free rate over Q5 is that it lies in the range 1.75-2.5% with a most likely range of 2-2.5%.

[15] Presentation based on figure contained in PWC (2004)

4.2.2. The debt premium

Debt spreads of investment grade rated borrowers have also narrowed very significantly in recent years. Figure 4.4 shows corporate debt premia for debt rated AAA, A and BBB for the period 2003-6.

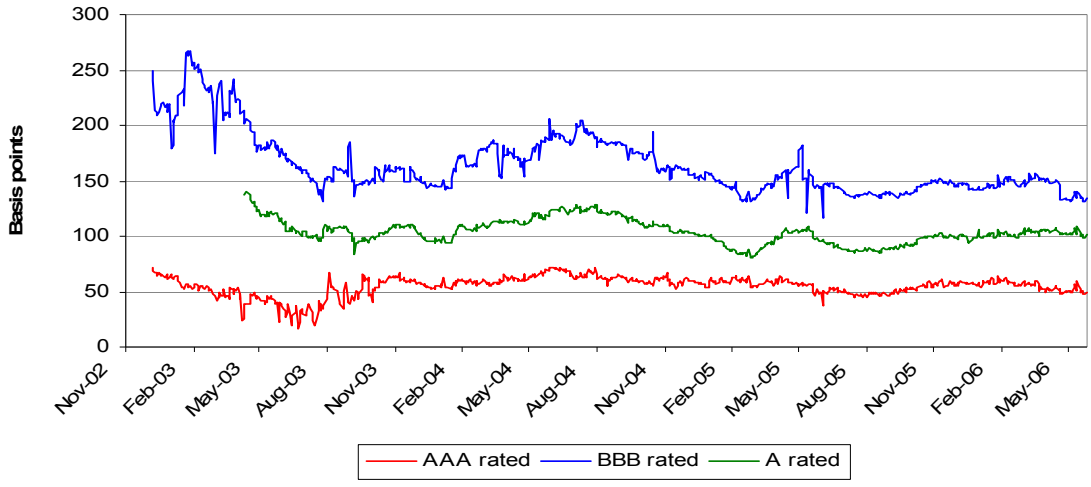
The relevant debt premium for use in the WACC analysis is the premium that would be incurred by an efficiently financed business with comparable business and regulatory risks. We argue later in this section that optimal gearing for BAA's regulated businesses is in the range 50-60%. The debt premium should reflect the default risk of a company with this net debt:RAB ratio.

In our view if BAA's regulated businesses had gearing in this range it would comfortably achieve a 'solid' investment grade rating, i.e. A or better. We are aware of ratings advice in the water sector that suggests that a regulated water business should be able to maintain a solid investment grade rating with a net debt:RAB in excess of 60%. Appendix B provides details of credit ratings and gearing for a selection of regulated businesses[16]. This evidence also suggests that regulated businesses can support solid investment grade ratings at relatively high levels of gearing.

Therefore the debt premium in the WACC analysis should reflect a solid investment grade credit rating (i.e. of around –A, A or A+ S&P rating)

Figure 4.4 indicates that the debt premium on long dated A-rated sterling bonds has averaged about 1.0% pa in recent years.

Figure 4.4: UK investment grade credit spreads on 20 year bonds



Source: Bank of England and Reuters

[16] Source: Reuters. The credit rating and gearing information for these companies is at the group level and is not strictly comparable to the net debt:RAB for BAA's London airports. However, given that the regulated elements of these businesses are generally able to support a lager amount of debt than the non-regulated parts (for a given credit rating), we believe that they are reasonable comparators.

Figure 4.5 sets out recent regulators determinations of the corporate debt premium. The assumed values generally reflect the observed debt spreads on A-rated paper.

Figure 4.5: Recent regulators' assessments of the debt premium

Regulator	Case	Debt premium (%)
CAA	BAA (2003)	0.9-1.2
CAA	NATS (2005)	1.2
Ofgem	TPCR (2006)*	1.1
Postcomm	Royal Mail (2005)	0.5
Ofcom	BT (2005)	1.0
Ofgem	DPCR (2004)	1.0-1.8
Ofwat	Water & sewerage (2004)	0.8-1.4
Ofcom	Mobile call termination (2004)	1.0-3.5

**Initial proposals* *Source: Regulatory determinations*

BAA's actual cost of debt has reflected a particular financing strategy, which until 2005 involved maintaining a low corporate debt/debt+equity ratio. This enabled it, in early December 2005 (prior to its purchase of Budapest airport), to achieve a corporate rating of A+ from Standard & Poors (S&P)[17]. The ratings agencies were fully aware at the time that BAA's gearing would rise steadily as the capital programme – notably for T5 – was implemented. That was the context in which S&P confirmed its A+ rating.

Following BAA's successful bid for Budapest airport and the associated increase in corporate debt and reduction in corporate credit quality, S&P downgraded BAA's long term corporate credit rating from A+ to A with a 'stable' outlook, resulting in a small increase in the debt premium applicable to the company. There is no separate rating of the UK regulated businesses[18].

In its recent bid defence BAA scrapped its former financial strategy and announced that, were the bid to fail, it would fund increased distributions to shareholders by raising new debt. It said that the company's debt/shareholders' funds ratio would peak at 140% equivalent to a debt/debt+ equity ratio of about 58%. Since most of the cash flow available to support debt service is derived from the regulated UK businesses, the equivalent debt:RAB ratio for the regulated business would be significantly higher (we estimate in the range 65-70%).

Had this proposed financial strategy been implemented, BAA's actual debt premium and cost of debt would have increased by an amount reflecting whatever rating downgrade resulted. In practice, following the announcement of the agreed acquisition by Ferrovial, S&P has downgraded BAA's corporate rating to BBB+, two notches down from its

[17] Standard & Poors, European Airport Credit Survey, November 2005

[18] It may be appropriate to consider further, in the context of a discussion about ring-fencing the regulated portion of the business, the possibility of identifying a separate rating of the regulated business as well as for BAA as a whole.

post-Budapest rating of A. This will increase its marginal cost of debt by about 30-40 bp.

These considerations serve to focus attention on why it is not correct for regulators to assess the allowed debt premium based on the actual gearing and actual cost of debt. A large increase in debt (used, for example, to finance a reduction in shareholders' funds) will increase the actual debt premium and gearing. It would be wrong to increase the allowed cost of debt (and therefore user charges) and impose on users the costs of this particular financing strategy just because the company changed its distribution policy. This reinforces the view that the allowed cost of debt should be assessed assuming an efficient or 'optimal' financing strategy is adopted.

Our assessment of BAA's debt premium in Q5 takes account of the following:

- The appropriate debt premium is that which reflects a regulated business with comparable business and regulatory risks and gearing (debt/RAB) in the range 50-60%.
- In that gearing range BAA's regulated business could expect to achieve an A debt rating.
- The debt premium on long dated A-rated Sterling bonds in recent years has been stable at about 1% pa.
- Over Q5 there is more likelihood that debt spreads will widen than that they will narrow further. If spreads increased steadily over Q5 from current levels to 1.5% then the average spread over the period would be 1.25%.

Taking into account all of the above, our assessment of BAA's debt premium over Q5 lies in the range 1-1.25%.

The cost of debt is the sum of the risk free rate and the debt premium. Our assessment of the cost of debt is therefore (2-2.5) + (1-1.25) = 3-3.75%. Section 4 provides a discussion of the most likely value that should be used in the WACC determination. Our view of the appropriate point in the range depends on whether CAA accepts our suggestion to include automatic triggers to allow for intra-period adjustment of the allowed cost of debt in the event that benchmark rates move outside a pre-specified range.

4.3. The Cost of Equity

4.3.1. CAPM

Parameter values

We first estimate the cost of equity using the CAPM model. CAPM says:

$$CoE = r_f + \beta(ERP)$$

where $CoE =$ cost of equity

$r_f =$ risk free rate

$ERP =$ equity risk premium for the market portfolio

$\beta =$ measure of non-diversifiable risk of the security relative to the market portfolio

According to CAPM the cost of BAA equity is fully specified by r_f, ERP and β. The first two of these variables are 'economy-wide', only the β is sector specific.

Risk free rate: The earlier discussion (see section 4.2.1) indicates a most likely range of 2-2.25% over the Q5 period.

Equity Risk Premium: The equity market risk premium (ERP) is the extra return (over the risk free rate) which investors must expect to earn if they are to hold a portfolio of (volatile) equities rather than risk free securities. Estimation of the ERP is fraught with difficulties. It is a variable whose value cannot be directly observed. It is usually estimated by determining the ex post 'excess returns' of a market portfolio over the historic risk free rate. The value of the ERP measured in this way is sensitive to the period over which the average is measured; to whether the arithmetic or geometric mean is used and to whether the 'market portfolio' is made up of a portfolio of UK or 'global' equities. This estimation method assumes that ex post 'excess returns' are a fair reflection of the, ex ante, expected excess returns. Although the theory assumes that the ERP is constant over time, ex post excess returns vary over time and there is evidence that suggests that the ex ante ERP varies systematically over the business cycle[19].

Smithers (2003) estimates a value for the ERP based on long run historic excess returns in the range 3-5%[20]. The ERP is a parameter of great interest to the financial markets and many City analysts make their own estimates. However their estimates tend to vary over the business cycle from a low of 2% during bull markets to a high of 4% in bear markets.

Figure 4.6 reports some of the ERP values used by regulators since 2002. The CAA review of Manchester Airport in 2003 used a range of 2.5-4.5%. Ofwat increased its 2004 value range to 4-5% from 3-4% in 1999. Ofgem in 2004 used a range 2.5-4.5% compared to 3.25-3.75% in 1998.

[19] Fama and French (1989)

[20] Smithers (2003)

Figure 4.6: Recent regulators' assessments of the equity risk premium

Regulator	Case	Equity risk premium
CAA	BAA (2003)	2.5-4.5%
CAA	NATS (2005)	3.5-5.0%
Postcomm	Royal Mail (2005)	3.5-5.0%
Ofcom	BT	4.5%
Ofgem	DPCR (2004)	2.5-4.5%
Ofwat	Water & sewerage (2004)	4.0-5.0%
Ofcom	Mobile call termination (2004)	5%

Source: CEPA analysis of regulatory determinations

Our assessment of the value of ERP takes account of the following:-

- The Smithers estimate based on long term ex post excess returns of 3-5%.
- The increase in the value range used by regulators in recent years.

In our view the value of ERP lies in the range 3-5%.

Equity beta: The beta is a measure of the non-diversifiable risk of an asset. It is measured as the co-variance between returns on the asset (in this case BAA shares) and returns on the market portfolio, divided by the variance of returns on the market portfolio.

The value of the measured equity beta reflects not only business risks but also the risks induced by financial leverage. Equity betas have, therefore, to be adjusted to normalise for different gearing across companies and for the same company over time. This involves 'de-levering' the equity beta to derive the 'asset beta'. This is done using the formula:

$$\beta_{equity} = \beta_{asset}(1+\frac{D}{E})$$

where D is the value of debt

and E is the value of equity

Strictly, *D* and *E* should be valued at market values but usually book values are used for simplicity.

If the formula holds across a wide range of D/E values it can be used to derive the equity beta for a company with any assumed 'notional' gearing. For example, the implied equity beta of an asset with 80% D/E is:

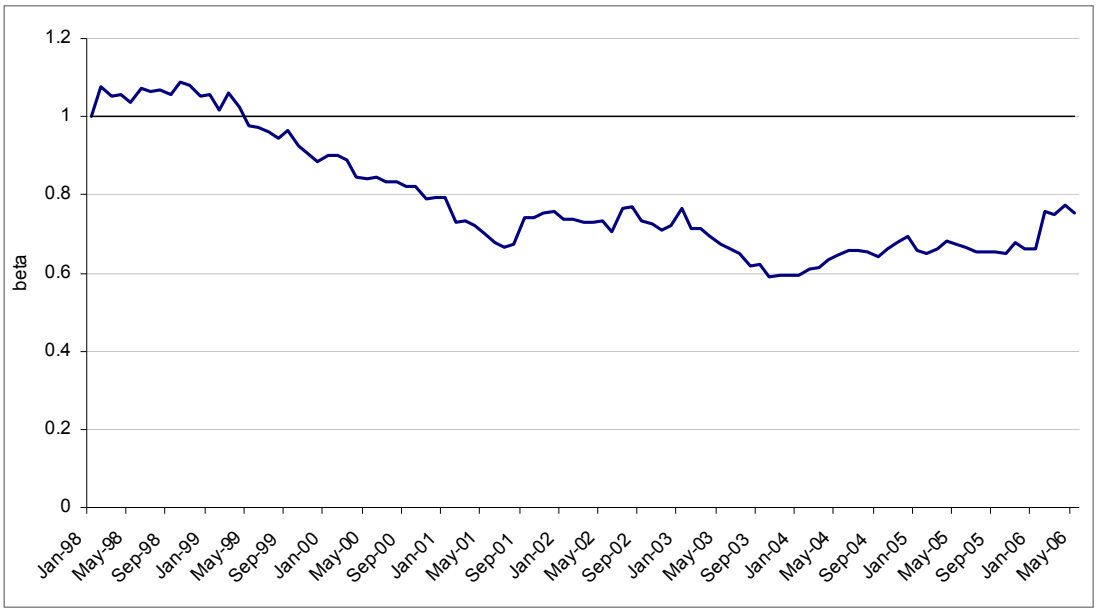
$$\beta_{equity}(80\% D/E) = \beta_{asset}(1+\frac{0.8}{0.2})$$

Figure 4.7 sets out the historic value of the equity beta for BAA since 1998. It shows a pronounced decline to 2001/02 and a more gradual downward trend since then, despite the company's gearing rising over the period. The average beta over the past seven years

is 0.8 and the average since 2001 is 0.7 with a May 2006 equity beta value of 0.75[21]. The increase in 2006 of BAA's beta is closely linked to the bid activity which caused a sharp relative increase in BAA's volatility. This cannot be regarded as evidence of an increase in the systematic risk of the regulated business.

Over the period, BAA gearing has increased from around 25% in 2001/02 to close to 50% by March 2006[22]. Other things being equal, the equity beta should increase as gearing rises. However, Figure 3.6 suggests that over the period the equity beta has in fact fallen, until bid activity increased it. An uncritical interpretation of this data would suggest BAA's systematic risk (reflected in its asset beta) has fallen since the later 1990's, and has continued to fall through Q4.

Figure 4.7: BAA 5 year rolling equity beta



Source: London Business School – Risk Management Service[23]

As noted earlier, uncritical use of historic betas often gives implausibly low values for the cost of equity. As a result some regulators have retained the 'form' of CAPM, but actually derive the cost of equity drawing on a range of other approaches (discussed later) and 'back filling' to derive a beta value that fits with their assessment of the 'correct' cost of equity. This 'back filling' approach results in the use by some regulators of betas significantly higher than the historic measured values.

Figure 4.8 shows the measured historic betas and the assumed betas used recently by several regulators. It shows, for example, that Ofwat (2004) used an equity beta for a 55% geared water company of 1.0 despite the fact that measured equity betas were very

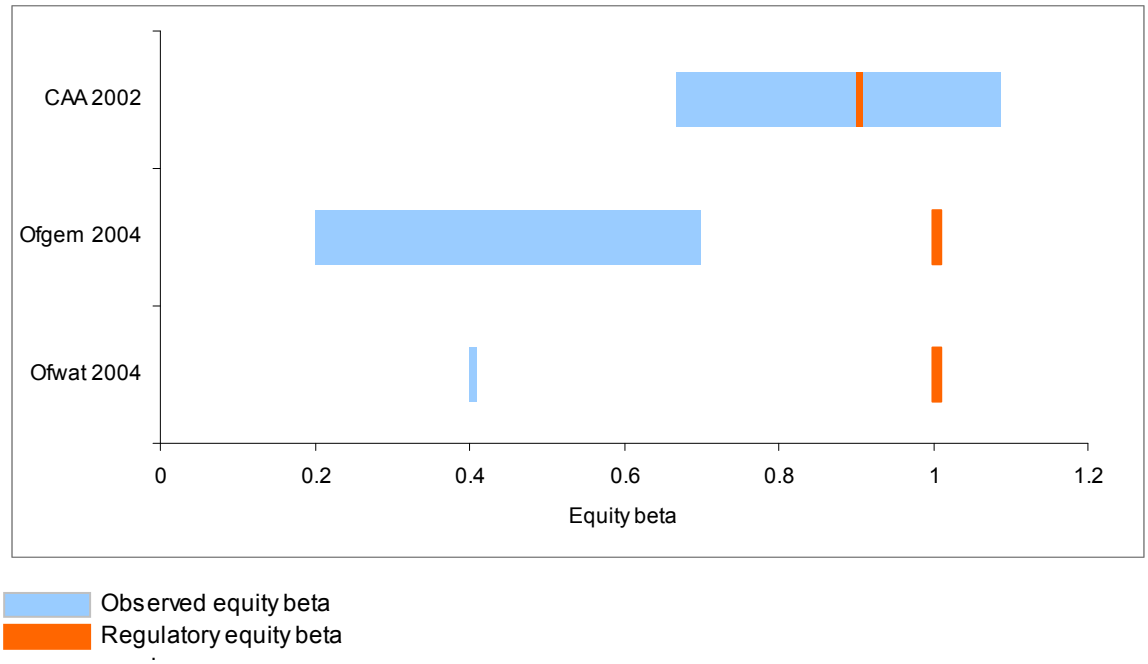
[21] LBS – Risk Management Service, May 2006

[22] CEPA estimate of net debt:debt+equity. This includes debt issued to fund the purchase of Budapest airport since the acquisition is reflected in BAA's observable, corporate beta.

[23] The risk measures are estimated using five years of monthly data on month-end security prices (the marked price on the last day of the month, from the Stock Exchange Daily Official List), and on index levels (the Financial Times – Actuaries All Share Index). These data are described in Smithers (1977). The returns, which include dividends, are converted to a continuously compounded basis.

much lower than this (0.4). It also chose to ignore the steady downward trend over a decade in measured equity betas.

Figure 4.8: Betas used in regulatory CoC determinations are higher than betas observed in the market



Smithers (2003) and others have argued that, in view of the difficulties of deriving the prospective beta from historic data, the default assumption should be that the non-diversifiable systematic risk of any industry is no different to the non-diversifiable risk of the market portfolio, i.e., a beta of 1.0. This would seem to argue for ignoring CAPM entirely. Other analysts argue that the beta value should bear some relationship with the intuitive relative systematic risk of the industry. In this view, which we share, airports particularly Heathrow and Gatwick should be viewed as less risky than the market portfolio but as slightly more risky than, say, regulated electricity distribution and water companies[24]. This is because airports have more demand side risk than water and electricity distribution businesses but less demand side risk than businesses operating in highly competitive sectors.

Our assessment of the value of BAA's equity beta for its regulated business normalised to a debt/RAB ratio in the range 50-60% takes account of the following:

- BAA's corporate 5 year average equity beta is 0.7 and the 10 year average is 0.8.
- The judgement that the systematic risk of BAA's regulated business is lower than the 'equity market' as a whole, but higher than water and electricity distribution.

In our judgement the equity beta for BAA's regulated businesses, normalised to 55% debt/RAB, lies in the range 0.8-0.95. The low end of the range is close to BAA's long

[24] The extent of demand side risks should not be overstated. First, over the past five to ten years the volatility at Heathrow and Gatwick has not been that great in practice – partly reflecting the fact that these airports are close to their capacity. Indeed, for shocks that have occurred, passenger numbers have recovered relatively quickly. Further, BAA is only subject to volume risk for the life of the existing price control, any lingering affect of a shock is addressed in the following review.

run average beta and higher than the 5 year average. The top end of this range is a small discount to the beta of the equity market as a whole.

CAPM-derived cost of equity

Figure 4.9 shows the CAPM derived cost of equity for BAA:

Figure 4.9: CAPM derived cost of equity for BAA

Parameter	All Low (%)	All Central (%)	All High (%)
Risk free rate	2.0	2.25	2.5
ERP	3.0	4.0	5.0
Equity β (55% gearing)	0.8	0.875	0.95
Cost of equity	**4.4**	**5.75**	**7.25**

If the central values of the parameter ranges are combined the cost of equity is 5.75% real; if all high end of the range values are used the cost of equity is 7.25% and if all low end of the range values are used it is 4.4%.

4.3.2. Other Approaches to Determining the Cost of Equity

It is increasingly recognised that CAPM needs to be supplemented by other approaches for determining the cost of equity[25].

MR ratio analysis

The MR ratio of a listed regulated business is the ratio of its market capitalisation to its RAB. The MR ratio can provide useful additional information about a company's 'true' WACC. The premise on which MR analysis is based is that if the market expects a regulated company to achieve operating and capital performance in line with the regulator's assumptions and if the allowed WACC equals the 'true' WACC then the MR ratio will be 1.0. This is because the NPV of expected net cash flows should, if the regulator's assumptions hold, equal the value of the RAB. Equally if the allowed WACC is higher or lower than the 'true' WACC, and the market expects the regulated company to perform in line with the regulatory assumptions, then the MR ratio will be greater or less than 1.0, respectively.

MR analysis is most readily applied in industries where there are many broadly comparable regulated companies, e.g. water. MR ratios for certain companies may be higher or lower than the values for other companies reflecting differential operating and capital efficiency, but the sector average MR ratio provides a useful cross-check on the CAPM derived WACC.

Applying MR ratio analysis to BAA is more problematic because there are no relevant comparators in the airport sector. The observed MR ratio may be higher or lower than 1.0 because of company-specific considerations. Nevertheless we have used this approach as one additional indicator of the WACC of BAA.

[25] See Palmer and Nixon (2005)

The MR ratio for BAA gained prominence when BAA used this methodology in its bid defence to justify rejection of a particular share price offer by Ferrovial. BAA drew attention to the MR premia exhibited by listed water companies (MR range 1.07-1.16) and similarities between BAA and water companies to argue that BAA's value (for the regulated businesses) should also reflect a comparable MR premium.

Until the Ferrovial bid first became public, BAA had been trading on a MR ratio slightly lower than 1.0 according to city analysts. The recommended Ferrovial 'offer price' values the regulated businesses on a MR ratio of 1.21[26] - using the £9.5 billion RAB figure cited by CAA recently[27]. This is a higher MR premium than exhibited by the water companies.

However, care is needed in interpreting this ratio:

- It may be because Ferrovial believe (as they say in their offer document) that BAA can operate efficiently with lower operating costs. In which case the operating efficiency targets set for Q4 are too relaxed; and/or
- Ferrovial plan to spend less on capital expenditure than the regulatory assumptions in Q4 while achieving the output targets; and/or
- Ferrovial may be over-paying for this business and will end up earning lower equity returns than the allowed cost of equity; and/or
- The allowed cost of equity is too high.

The MR premia observed in the water (and electricity network businesses) are almost certainly explained in large part by the fact that the allowed cost of debt since 2004 has been much higher than the actual cost of debt. This 'gap' which now exceeds 1.0% pa would explain much of the observed MR premia in those industries. In short they are a reflection of the fact that the allowed cost of debt – and the WACC – are currently significantly higher than their actual cost.

Dividend Growth Model

The dividend growth model (DGM) is based on the premise that the value of any share is the NPV of the future stream of dividends per share. DGM states that the nominal cost of equity equals the dividend yield per share plus the sustainable nominal expected growth in dividend per share. For listed companies the dividend yield can be observed. If the sustainable dividend growth rate can be estimated then the cost of equity can be determined. However, estimating the sustainable long term growth in dividend per share is subject to very considerable uncertainty.

We have very roughly estimated the DGM-based cost of equity using City analysts' estimates[28] of expected sustainable dividend per share (DPS) growth published before

[26] See Appendix 2 for further analysis

[27] CAA (2006a): *"As at 1 April 2006, Heathrow, Gatwick and Stansted had a combined, projected regulatory asset base of approximately £9.5 billion [in 2004/05 prices]"*, p8.

[28] Taken from a range of brokers report produced in late 2005 prior to the Ferrovial merger activity.

the Ferrovial bid and BAA's bid defence. Given, at that time, a yield of about 3-3.5% and expected real dividend per share growth of 2-3% and expected inflation of 2-2.5% the DGM-derived estimate of the real cost of equity lies in the range 5.0 - 6.5%. However, little confidence can be placed in this estimate because the sustainable DPS growth rate is itself dependent on the regulatory determination and market expectations have changed since the bid was announced.

4.3.3. Estimates by other Regulators

Figure 4.10 sets out the cost of equity assumptions used by the CAA for the London airports Q4 review, the Manchester airport review, by Postcomm, Ofcom, Ofgem and Ofwat.

Figure 4.10: Recent regulators' assumptions on the cost of equity

Regulator	Case	R_f (%)	ERP (%)	β	CoE Range (%)	CoE Used (%)
CAA	BAA (2003)	2.5-2.75	2.5-4.5	0.8-1.0	4.5-7.25	6.38[29]
CAA	NATS (2005)	2.5	3.5-5.0	0.5-0.6*	5.53-7.14	6.65
Ofgem	TPCR (2006)**	2.3	n/a	n/a	n/a	7.0
Postcomm	Royal Mail (2005)	2.5	3.5-5.0	0.81-0.94	5.13-6.26	5.67
Ofcom	BT (2005)	2.0	4.5	1.14-1.23	7.13-7.54	7.33
Ofgem	DPCR (2004)	2.25-3.0	2.5-4.5	0.6-1.0	3.75-7.5	7.5
Ofwat	W&S (2004)	2.5-3.0	4.0-5.0	1.0	6.5-8.0	7.7
Ofcom	Mobile call termination (2004)	2.2	5.0	1.0-1.9	7.2-11.7	9.45

**asset beta* *Source: CEPA analysis of regulatory determinations*

*** Initial proposals*

In Q4 the CAA estimated a cost of equity range of 4.5% - 7.25%. The mid point of this range was 5.88%. However, because the 'ERP smoothing' and T5 adjustments were equity related, it is more appropriate to think of the Q4 'determination' of the post-tax cost of equity as about 6.38% (equivalent to a pre-tax cost of equity if the effective tax rate is the statutory rate of 9.1%).

The 2003 CAA review of Manchester airport estimated a 5.2-6.85% range and used 6.2%. Ofgem identified a wide range (3.75-7.5%), dismissed the low end of the range as implausibly low and used a value of 7.5% at the top end of its range. Ofgem in its recent

[29] 6.38% is the cost of equity consistent with the 7.75% pre-tax WACC if the adjustments made to the Q4 pre-tax WACC (derived from the CAA's mid point values) are assumed to relate wholly to the cost of equity. The adjustments are the ERP, T5 and rounding adjustments (of 25bp, 25bp, and 14bp respectively). The uplift to the post tax cost of equity is calculated by stripping out the tax uplift (30%) and gearing assumptions (25%) used in Q4 pre-tax WACC calculations (i.e. the adjustments (0.64%) * (1–t) / (1-g) = 0.6%). The adjusted mid-point post-tax cost of equity is therefore (5.775% + 0.6% = 6.38%).

Note that the 14bp rounding adjustment is the adjustment that is necessary to get from the BAA Q4 central estimate of 7.11% using the mid-points of the parameter values to 7.25%.

(2006) initial proposals for the transmission price control review describes its 2004 determination for electricity distribution companies as 'conservative' and in 2006 uses, in its preliminary proposals, a 7% cost of equity which it describes as the mid-point of long run average market returns that range between 6.5-7.5%. Ofwat in 2004 identified the range of 6.5-8.0% and ended up using a value of 7.7% in circumstances where the regulatory risk premium in the cost of equity had been increased by the events surrounding the 1999 water determinations.

Our estimate of the post-tax cost of equity takes account of the following:

- The CAPM-derived range is 4.4 - 7.25%.
- The DGM methodology suggests with low confidence a range of 5-6.5%.
- Comparisons with other regulators' determinations suggest a value in the range of 6.5-7.5%.
- The allowed post-tax cost of equity set by CAA in Q4 adjusted to include the 'uplifts' to the WACC was about 6.4%. Since then gearing has increased significantly – which other things being equal might push up the cost of equity. This has been offset in part at least by a lower risk-free rate, and a reduction in the market's view of the systematic risk of BAA[30].

Our assessment of the post-tax cost of equity range is 6.0-7.25%. We disregard values at the low end of the CAPM range because they are in conflict with direct market evidence. The low end of our range is higher than the mid-point of the CAPM range. The high end of our range is set at the top end of the CAPM range and is consistent with other evidence about the cost of equity.

The implied values of the equity market risk premium and equity beta consistent with our cost of equity range are shown in Figure 4.101.

Figure 4.101: CEPA Assessment of BAA's Cost of Equity for Q5 (Implied CAPM input parameters)

	Low (%)	**Mid (%)**	**High (%)**	*CAA Q4 Mid (%)*
Risk free rate	2.0	2.25	2.5	*2.625*
Equity market risk premia	5.0	5.0	5.0	*3.75*
Equity beta (55% gearing)	0.8	0.875	0.95	*0.9*
Q5 Post-tax CoE	**6.0**	**6.625**	**7.25**	*5.88 (6.38)*[26]

The mid-point value of the cost of equity range is consistent with an equity market risk premium of 5% and an equity beta of 0.875 (or an equity market risk premium of 4.4% and an equity beta of 1.0). We believe that this value fully takes into account the developments since Q4, including the increase in gearing experienced by BAA.

The top end of the range (7.25%) implies an equity market risk premium of 5% and an equity beta of 0.95 (or an equity market risk premium of 4.75% and an equity beta of

[30] Implied by reductions the asset beta as discussed above in Section 4.3.1

1.0). The low end of the range (6.0%) implies an equity market risk premium of 5% and an equity beta of 0.8 (or an equity market risk premium of 4% and an equity beta of 1.0).

4.4. Gearing and Taxation

4.4.1. Gearing and Post-tax Vanilla WACC

To set the allowed WACC the CAA must determine the proportions of debt and equity that an efficiently financed business would use, i.e. it must determine the appropriate debt/RAB ratio to be used to calculate the WACC. The values of the cost of equity and cost of debt must be consistent with the selected debt/RAB ratio because the cost of equity and the debt premium are a function of the assumed debt/RAB ratio.

In principle, the CAA is seeking to determine the debt/RAB ratio that would be selected by an efficiently financed company assuming that the cost of equity and cost of debt are correctly set. In principle, there are three possible approaches that CAA could adopt: (i) estimate the optimal gearing; (ii) use the current actual gearing; or (iii) use projected gearing.

Optimal gearing

In a regulated business where the cost of equity and debt are correctly set, the management will choose the debt/RAB ratio for the regulated business that equates the marginal interest tax shield benefit and the marginal default risk cost. Optimal gearing is therefore a function of: the tax position of the regulated business; and the diversifiable and non diversifiable business and regulatory risks facing the business. Businesses with more volatile cash flows will have higher default risk at any given level of gearing. The higher the cash flow volatility, the lower will be the optimal debt/RAB ratio other things being equal.

CAA should be concerned with the gearing of the regulated businesses only. If BAA acquires, for example, a relatively high risk international airport business that increases cash flow risk at the Group level this should not impact in any way on decisions about efficient financing of the regulated UK airports.

How can the 'optimal' gearing for BAA's regulated businesses be determined?

Regulated airports are relatively more risky than, e.g., regulated water companies[31], but relatively less risky than companies operating in highly competitive industries.

Companies operating in competitive industries with investment grade ratings tend to target debt/debt+ equity ratios no higher than 40-50%. In contrast regulated water and sewerage companies, subject to price regulation, are able to retain solid investment grade ratings with debt/RAB ratios as high as 70% (and in some cases higher).

This suggests that the appropriate debt/RAB range for BAA's regulated business lies in the range 50-60%.

[31] Although see Footnote 24 in relation to the extent of the difference in risk.

Other regulators' determinations provide further evidence about optimal gearing. In 2004 Ofwat and Ofgem – in setting determinations for relatively less risky businesses – used the mid-point of the debt/RAB ranges of 50-60%.

In 2006 Ofgem in its initial transmission price control used 60% 'in line with the assumptions underlying the current transmission controls'.

As noted earlier, in late 2005 S&P rated BAA at the Group level A+ when it was expected that debt/debt+ equity of the Group would rise to about 45%. The BAA bid defence would have raised the corporate debt/debt+ equity ratio to 58% (and the debt/RAB ratio of the regulated businesses would have been in the range 65-70%[32]). Although details are not yet available, we anticipate that Ferrovial's post-bid financing of BAA will involve a high proportion of debt and that they will expect to retain an investment grade rating.

Actual gearing

An alternative approach to setting the WACC gearing assumption is to use the current BAA gearing. However, we do not believe that there is any logic at all that favours this approach. In Q4 gearing was based on actual gearing (25%) when it was well known that the actual gearing would rise. Using the actual gearing implicitly assumes: (i) that actual gearing of BAA corresponds to the efficient financing strategy for the UK regulated assets; and (ii) that BAA will maintain this level of gearing over Q5 by raising additional debt and equity in proportions that will leave the ratio unchanged. There is no reason to believe that this is what they plan to do. Indeed, there is much to indicate that it is neither what they plan to do, nor what an efficiently financed company would do.

Projected gearing

Projected gearing is a function of the planned capital expenditure programme, the efficiency of operations (which is a major determinant of internal cash flow generation) and the price control determination in Q5 (which determines allowed revenue for operating costs, depreciation, tax and the cost of capital). If it is assumed that BAA's regulated business is neither financed with new equity or makes additional shareholders distributions (e.g. through special dividends) then it is likely that projected gearing of the regulated businesses will rise gradually as new net investment is incurred.

Before the acquisition of Budapest airport and the Ferrovial bid – when the regulated UK airports constituted the great majority of BAA's assets – the ratings agencies expected a gradual increase in BAA's corporate debt to about 45% debt/debt+ equity and that BAA would retain a high investment grade rating.

However, using the projected gearing in this way assumes that the efficient financing strategy involves raising no new equity or raising new debt to finance one-off shareholder

[32] Our estimate of net debt:RAB of 71% includes all of the additional debt issued for the acquisition of Budapest, reflecting the fact that it is secured on the cashflows of the regulated business. However, in practice we would expect Budapest to be able to support a proportion of the debt – which suggests that the actual net debt:RAB of the regulated business is in the range 65-70%.

distributions (i.e. reduce equity). This is certainly not the only available financing strategy as BAA has made clear in its bid defence when it proposed a new capital structure with Group level debt/debt+ equity rising to 58%. We await details of the proposed financing strategy of BAA's new owner, Ferrovial, but an increase in net debt above pre-bid expected levels appears very likely. There has been no change in the business and regulatory risks of the regulated businesses.

It cannot be right to use uncritically in the WACC calculation either the 'old' projected gearing or the 'new' projected gearing. The question to be answered by CAA is what is the efficient financing strategy, i.e. what is the optimal gearing?

CEPA assessment

We are strongly of the view that CAA should form a view of the sustainable net debt/RAB ratio that an efficiently financed regulated UK airports business would choose and set the allowed WACC and allowed revenues on this basis. In doing so it should take account of the business and regulatory risks and the projected pre-finance post-tax net cash flows of the regulated businesses. An efficiently financed business should be able to finance its activities and pay a dividend consistent with the cost of equity assumption and service its projected debt while retaining a solid investment grade rating for the regulated businesses.

Note that this may be very different to the actual corporate financial strategy adopted by BAA's new owners.

Our assessment of the appropriate optimal gearing of BAA's regulated UK airports business takes account of all the considerations set out above. We consider that the appropriate debt/RAB range to use when setting the allowed WACC is 50-60%. This lies above the range that would be considered appropriate for investment grade rated companies operating in fully competitive industries and below the range appropriate for investment grade rated companies with lower risk such as water and electricity distribution companies.

Ofwat and Ofgem both made an estimate of the optimal gearing when setting the WACC. In their 2004 determinations, despite evidence that 60-70% debt/RAB ratios were sustainable for investment grade rated companies, they set the gearing for regulatory purposes in the range 50-60%. This conservative stance formed part of their overall WACC judgements. A similar approach by CAA might suggest that a debt/RAB ratio below the mid-point of the 50-60% range would be considered the most appropriate if it also decided to adopt a conservative stance.

Estimation of optimal gearing for the purpose of setting the allowed WACC does not imply that CAA is in any way 'telling BAA how it should finance its business'. It is a necessary step in the regulatory process of setting price controls. Once maximum prices are set BAA will remain free, as now, to choose its financing strategy in any way it wishes (consistent with its duties to shareholders, lenders, the CAA etc). What the proposed approach does avoid is enabling the owners to pass to users of the regulated airports any extra financing costs associated with, e.g. a highly leveraged financial structure. If the

proposed approach is adopted, such costs, if incurred, will not raise airport user charges but will properly be borne by shareholders.

4.4.2. Allowing for taxation costs

When determining the additional allowed revenues to fund taxation costs, the regulator must decide whether to allow a notional amount that would be payable by the regulated businesses if the effective rate of corporate tax was equal to the statutory rate – or whether to allow revenue sufficient to fund the actual amount of taxation costs that are expected to be paid in respect of the regulated businesses over the Q5 quinquennium.

There are two distinct but related reasons that actual taxation costs may be lower than the notional amount derived using the statutory tax rate:

- There is often a difference between the capital allowances that may be deducted for tax purposes and the amount of regulatory depreciation funded in the price control.
- The actual amount of interest tax shield (arising from the deductibility of interest on debt) may be different from the value of the interest tax shield funded in the price control period.

The way in which the regulator allows for taxation costs impacts on (i) whether the allowed funding is more than is required to meet the actual taxation costs; and (ii) on the marginal incentives to change the net debt:RAB ratio of the business over time.

We distinguish a number of different possible ways of dealing with taxation costs.

Optimal-Notional approach: This is the term we use for the approach whereby the only adjustment for the taxation costs is the grossing-up of the post-tax cost of equity by the statutory tax rate. It is 'optimal' in that the gearing assumption used to compute the WACC is optimal gearing (not actual or projected) and it is 'notional' in that the tax wedge assumes that the effective tax rate in each year equals the statutory corporate tax rate.

This approach assumes (implicitly) that the capital allowances for tax purposes in each year equal the amount of regulatory depreciation allowed in the price control in the corresponding period and that actual gearing equals assumed or notional gearing. This approach, which in the past has been widely used by regulators, allows the regulated company to retain in full any annual difference between the allowed revenues to fund taxation costs and actual costs arising from both higher capital deductions and / or higher interest tax shield benefits. It retains the marginal incentive to increase the debt: RAB ratio above the notional debt:RAB ratio for so long as it has available taxable income (because additional interest is tax deductible and will reduce actual tax and further increase post-tax returns).

Optimal-actual approach: This is the term we use for the approach where the post-tax vanilla WACC is estimated using optimal gearing, but allowed taxation costs are based on an estimate of expected actual taxation costs over the price control period taking account of actual capital allowances and expected interest tax shield benefits. This approach,

which is now used by Ofwat and Ofgem, allows revenues sufficient to fund the estimated post-tax vanilla WACC plus the additional amount required to fund expected actual taxation costs that will be paid in Q5. This approach reduces the marginal incentive to increase actual gearing above notional gearing to benefit from the additional tax shield.

Actual-notional approach: CAA and Postcomm have previously used an actual-notional approach. The actual or projected gearing was used in the WACC calculation and a notional tax wedge was used to allow for taxation costs. This approach allowed BAA to retain the benefits of: (i) capital allowances for tax purposes being higher than regulatory depreciation; and (ii) the actual interest tax shield over Q4 being higher than was assumed by CAA at the start of Q4.

Both of these effects raise the ex post post-tax return on capital employed above the ex ante allowed post-tax WACC.

Although these tax effects eventually unwind, in a business like BAA's with significant ongoing net investment, they unwind very slowly indeed. Therefore, the NPV gain to BAA (and corresponding NPV loss to airport users) is likely to be very large. We have estimated that the undiscounted aggregate benefit to BAA over Q4 amounted to about £400 million[33].

CEPA is strongly of the view that the CAA should allow revenues sufficient to yield to providers of capital the estimated post-tax vanilla WACC and additional revenue sufficient to fund estimated actual taxation costs. Therefore, what we term the 'optimal-actual' approach is the recommended one. Expected taxation costs can be estimated once CAA has formed views about those other components of net cash flow that it has, in any event, to estimate e.g. capital expenditure, depreciation, operating costs, etc. Measurement problems are no more intractable for taxation costs than for the other net cash flow components. Risk and uncertainty are already taken into account (for all components including tax) in the risk premium built into the allowed WACC.

[33] See Appendix 3 for more detail on the actual level of tax paid over the last four years, and an estimate of the effective rate for BAA in Q5.

5. CEPA ASSESSMENT OF BAA'S WACC IN Q5

In this final section we set out CEPA's assessment of BAA's WACC for Q5 drawing on the evidence set out in Section 4.

5.1. Cost of Debt

Our assessment of the gross cost of debt of BAA's regulated UK airports businesses in Q5 is as follows:

- The full range of possible values for the risk free rate in Q5 is 1.75% - 2.5%. The lower end of this range is higher than the current rate. The high end of the range assumes that the risk free rate steadily increases to 3% by the end of Q5. Our judgement is that a conservative range for use by CAA is 2 – 2.5%.

  The low end of this range is significantly higher than the current rate reflecting our view that it would be imprudent to assume that the unusually low current real rates will continue throughout Q5. The high end of this range is conservative and assumes an increase in the risk free rate from around 2% at the beginning of Q5 to 3% by the end of the period. The mid-point of our range is close to the 10 year average risk free rate of 2.3%.

- The debt premium over the Q5 period, based on an optimally geared regulated business with a solid investment grade rating, lies within the range 1-1.25%. The low end of the range reflects current debt premia for comparably rated debt. The high end of the range reflects circumstances where there is steady widening of the debt premium throughout Q5 from current levels to 1.5% by the end of the period.

- In our view, the cost of debt over Q5, therefore lies in the range 3-3.75%, with a most likely value equal to the mid-point of the range, i.e. 3.375%.

5.2. Cost of Equity

Our assessment of the post-tax cost of equity of BAA's regulated UK airports business in Q5 assumes the business has a debt/RAB ratio in the range 50-60%. Our estimate of the cost of equity is 6.0-7.25%.

The rationale and supporting evidence is set out in Section 4.3. In summary:

- The low end of the range is above the mid-point of the CAPM–derived range.

- The high end of the range is set at the top end of the CAPM-derived range.

Our judgement reflects the fact that we consider it appropriate to take account of all available evidence when setting the cost of equity rather than placing undue reliance on CAPM. Also we consider it important to take full account of the equity risks facing the regulated business when setting the cost of equity so that CAA can be confident that BAA can, if necessary, finance its capital expenditure programme in part by raising new equity as well as debt.

5.3. Gearing

In Section 4, we argue for use of estimated optimal gearing when determining the allowed WACC. This approach is conceptually correct, has now been adopted by most regulators and is in line with the CAA's policy to set price caps according to regulatory fundamentals (rather than to accommodate any particular financing strategy adopted by BAA's old or new owners).

Taking account of the business and regulatory risks of the regulated UK airport businesses our judgement is that the appropriate optimal gearing range is 50-60% debt/RAB. We believe that if net debt/RAB of the regulated businesses were maintained in this range in Q5 then the regulated businesses - if efficiently operated – would retain a solid investment grade rating.

5.4. Taxation

For the reasons set out in Section 4.4, we are strongly of the view that the CAA should set allowed revenues sufficient to fund its best estimate of the post-tax vanilla WACC and allow additional revenues sufficient to fund expected actual taxation payments over the Q5 period.

This approach is used by both Ofwat and Ofgem. We believe that it is the correct approach for CAA, and is fully consistent with its recent statements[34], because:

- It ensures that allowed revenue to fund taxation costs is no more or less than is required to meet actual taxation costs; while
- Ensuring providers of equity and debt capital will receive post-corporate tax returns on capital invested equal to their opportunity cost of capital if the regulated businesses are operated efficiently.

5.5. BAA's overall WACC for Q5

5.5.1. Post-tax vanilla WACC

CEPA's assessment of BAA's post-tax vanilla WACC in Q5 is set out in Figure 5.1 below. The post-tax vanilla WACC range is 4.2- 5.5% with a most likely[35] value of 4.8%.

Figure 5.1 also includes the CAA Q4 mid point. As discussed above in Section 3.2.3, we believe that the ERP and T5 'adjustments' made in Q4 were in practice equity adjustments. We therefore argue that the 'actual' post-tax cost of equity used by CAA in Q4 was 6.38%. For ease of reference, the table also shows in brackets the unadjusted values of the post-tax cost of equity used and post-tax vanilla WACC used by CAA in Q4.

[34] CAA (2006a), paragraphs 9.70 – 9.72

[35] We refer to our point WACC estimates as 'most likely' rather than central since, as illustrated in Figure 4.3 they are not necessarily central estimates of the parameter values, particularly in relation to CAPM where we truncate the lower values.

Figure 5.1 shows that our central estimate for Q5 of 4.8% is around 0.9% lower than the 'actual' CAA Q4 post-tax vanilla WACC of 5.7%. Key points about this difference are as follows:

- Our most likely cost of equity of 6.625% is significantly higher than the Q4 determination central value adjusted for uplifts of 6.38%.
- Our most likely estimate of the pre-tax cost of debt is lower than the value used by CAA in Q4. However, it is our view that the central estimate is conservative – and assumes a significant increase in the risk free rate and debt premium from current levels. The lower value compared to CAA's assumption in Q4 reflects continued low market cost of debt for most of the past 10 years. As we discuss in Section 5, we believe that there are good reasons why CAA should use the lower end of our cost of debt range and protect BAA against unexpected sharp increases in the actual cost of debt by including automatic adjustments in the event that the actual cost of debt rises significantly above this level.
- The majority of the 0.9% difference between our estimate of the post-tax vanilla WACC and CAA's Q4 estimate is the result of the higher gearing assumption of 55% used in the central case, compared to the gearing used by CAA in Q4 of 25%. Despite a lower pre-tax cost of debt, CEPA's post-tax vanilla WACC for a common assumed gearing of 25% is broadly the same as the CAA's Q4 determination post-tax vanilla WACC of 5.7%[36].

Figure 5.1: CEPA Assessment of BAA's Post-tax Vanilla WACC for Q5

	Low (%)	Most Likely (%)	High (%)	CAA Q4 Mid (%)
Post-tax Cost of Equity	**6.0**	**6.625**	**7.25**	*6.38 (5.88)*
Pre-tax Cost of Debt	**3.0**	**3.375**	**3.75**	*3.675*
Gearing	60	55	50	25
Post-tax vanilla WACC	**4.2**	**4.8**	**5.5**	*5.7 (5.25)*

5.5.2. Pre-tax WACC

As discussed above, we believe that CAA should set allowed revenues based on the post-tax vanilla WACC (assuming 'optimal' gearing) and then allow additional revenues to fund expected actual taxation costs. Our expectation is that the effective tax rate of BAA's regulated businesses will be considerably lower than 30%. We have therefore illustrated the case where the effective tax rate is assumed to be 20%. Figure 5.2 sets out the pre-tax WACC range that corresponds to our post-tax vanilla WACC range, assuming the effective corporate tax rate is 20%. The pre-tax WACC range is 4.8 - 6.4% with a central value of 5.6%.

[36] CEPA Post-tax vanilla WACC, assuming 25% gearing is 5.69%. This compares with the BAA Q4 'actual' post tax vanilla WACC (i.e. including the ERP, T5 and rounding adjustments as part of the post tax cost of equity) of 5.70%.

For completeness, and given CAA's approach in Q4, Figure 5.2 also shows what the pre-tax WACC value range equivalent to our post-tax vanilla WACC range would be if the effective tax rate was equal to the statutory rate of 30%. In this case the pre-tax WACC range is 5.2-7.1% with a central estimate of 6.1%. For the avoidance of doubt, we do not believe that using the statutory rate would be appropriate if CAA keeps its current approach of setting allowable revenues using a pre-tax WACC. We therefore do not regard this as the correct range of estimates for CAA to focus on.

Figure 5.2 also allows a comparison of CEPA's proposed values against the CAA Q4 mid point (including the ERP and T5 adjustments) and the CAA Q4 mid points adjusted for a Q4 gearing.

In forming a view of the robustness of these 'most likely' estimates it is important to recognise that the ranges that we have used for the key parameter values here are conservative. In particular, as shown in Figure 5.3, our range of estimates for the cost of equity already rejects the lower end of the range of values derived from CAPM. The same is true of our estimate of the risk free rate – where the low end of our range is well above current rates. It is therefore inappropriate to make any further upward adjustments to these 'most likely' values. Therefore, it is our firm view that, in the absence of automatic adjustment mechanisms for the cost of debt, the appropriate WACC values are those in the 'most likely' column.

Figure 5.2: CEPA Assessment of BAA's WACC in Q5

	Low (%)	**Most likely (%)**	**High (%)**	***CAA Q4 Mid (%)***	***CAA Q4 Mid 55% Gearing (%)***
Gearing	60	55	50	25	55
Post-tax vanilla WACC	**4.2**	**4.8**	**5.5**	*5.7 (5.25)*	*4.9 (4.6)*
Pre-tax WACC (t=30%)	**5.2**	**6.1**	**7.1**	*7.75 (7.11)*	*6.1 (5.7)*
Pre-tax WACC (t=20%)	**4.8**	**5.6**	**6.4**	*6.9 (6.33)*	*5.6 (5.3)*

Figure 5.3: CEPA most likely range of WACC inputs

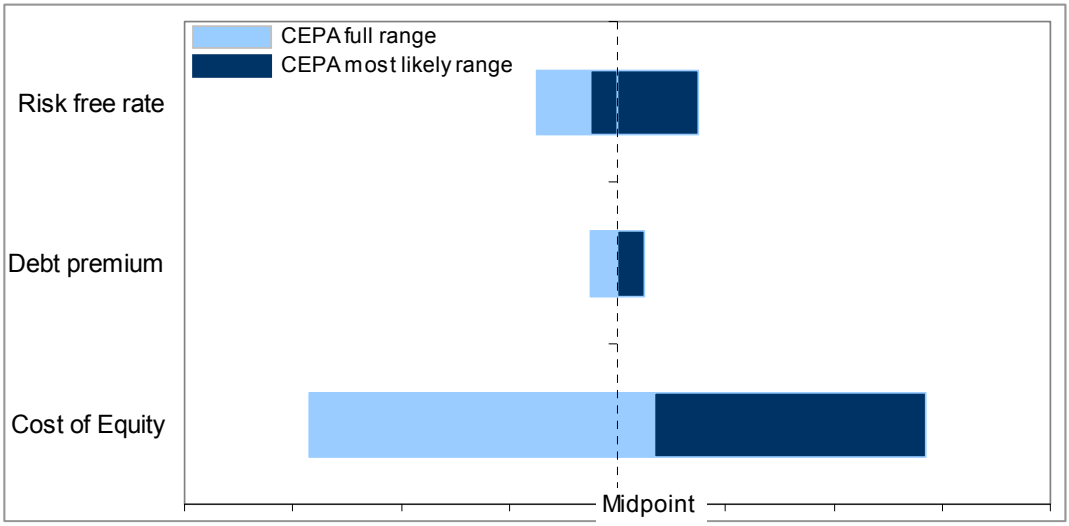


Figure 5.2 provides our assessment of BAA's Q5 WACC assuming that CAA decides not to introduce automatic adjustment mechanisms in relation to the cost of debt. Figure 5.4 provides our assessment of the appropriate allowed WACC in the event that CAA decides to include such automatic adjustment mechanisms along the lines discussed in Section 5. The only difference is the use in the latter case of the low end of the range of the cost of debt values (i.e. a risk free rate of 2% and a debt premium of 1%).

Figure 5.4: BAA's WACC in Q5

	%
Cost of Debt	3.0
Post-tax of equity	6.625
Gearing (debt/RAB)	55
Post-tax vanilla WACC	**4.6**
Pre-tax WACC (t=30%)	**5.9**
Pre=tax WACC (t=20%)	**5.4**

6. OTHER ISSUES

In this final section we comment on further relevant issues which have been raised in the CAA Policy Update paper and/or in response to the CAA's consultation paper:

6.1. Regulatory consistency and commitment

Regulatory consistency refers to the consistency of the regulator's methodology and process for setting periodic maximum prices. Regulatory commitment refers to regulators recognising that the *ex ante* risks and risk premia that were allowed for in an earlier price review period must continue to be funded over the full lives of long life assets.

Regulatory consistency

We agree with those who emphasise the importance of regulatory consistency, The financial markets do not like 'surprises' and poorly explained changes in methodology or process can (and sometimes have) raised the regulatory risk premium and therefore the cost of capital with adverse consequences for users/customers. It is clearly important that if a regulator intends to change its approach to regulation for any reason, the change is flagged well in advance, consulted on and explained clearly to the financial markets.

On the other hand regulatory consistency **does not** mean that a regulator can never change its methodology or processes if improvements are justified by the evidence and emerging regulatory best practice. In particular, changes that are intended to bring a regulator's methodology into line with best practice are least likely to have a detrimental effect on financial investors.

In BAA's submission to the CAA[37] they argued that the indicative 7.75% WACC for BAA in Q5 was relied upon by funders of BAA when they undertook the T5 investment. BAA suggested that changes to the rate applicable to Q5 would raise concerns in the financial markets and increase the regulatory risk premium in the WACC going forward. The CAA response to the consultation was robust on this point stressing that it had always been clear that the indicative determination for the Q5 period at the time of the Q4 review was subject to change in the light of new information during the Q5 review.

In our view the financial markets are well aware that the allowed WACC may change from review to review. They are well aware that the methodology for setting the WACC might change – as it has over time in other regulated industries – and that therefore the WACC value may change in light of changing market conditions.

In other price regulated industries, changes in methodology - on WACC input variables and WACC determinations - that have been clearly explained in advance, have not prevented companies raising long-term finance to fund large capital expenditure programmes.

[37] BAA/Q5/140

In the case of BAA it has not prevented Ferrovial from raising large amounts of finance to fund its bid **even though** CAA had clarified that the current price control review will review and may change all components of the indicative determination made for Q5 as part of the Q4 review. As CAA clearly recognises, the key judgement to be made is what the allowed WACC for Q5 should be to ensure that CAA's statutory duties are met in full. There can be no presumption that the answer is the same value as indicated at the time of the Q4 review.

Regulatory Commitment

The problem of 'regulatory commitment' arises in all price controlled industries where maximum prices are set for 5 years ahead when the life of the capital assets is much longer. Providers of capital funding need assurance that the allowed WACC in respect of long life assets will not be reduced below the ex ante cost of capital once the investments have been 'sunk' (and are in the RAB). Regulatory consistency and transparency and a consultative process can help address these concerns, but complete re-assurance is not possible without regulators binding their successors. Assuming that a regulator binding its successors is not feasible, some element of 'regulatory commitment' risk is likely to express itself in a regulatory risk premium in the cost of capital. The magnitude of this premium will depend on regulatory behaviour and abrupt changes in regulatory methodology will generally increase this risk premium. The magnitude of the premium can be picked up in MR ratio analysis because the MR ratio gives a direct indication of the risk premium used by financial market participants to discount future cash flows of regulated businesses.

Regulatory commitment is likely to be a greater potential issue for regulated businesses with highly 'lumpy' capital expenditure programmes, such as airports. This is because a higher share of the future cash flows to service capital costs will accrue beyond the next price control period. This places a greater importance on regulators in those industries communicating effectively and clearly the approach to regulatory consistency that they expect to adopt and to never acting so as to adversely 'surprise' the markets. It also strengthens the case for adoption in such industries of the sort of risk reduction mechanisms that we discuss below.

6.2. Interest rate risk

Confronted with the difference between the long-term, medium-term and short term real cost of debt regulators have tended to 'aim up' and use a cost of debt value much higher than the short to medium-term historic average. This approach has imposed extra costs on users and transferred 'excess' revenue to the companies and their owners because the actual cost of debt has been significantly lower than the allowed cost of debt since 1998. It is a key cause of the current significant MR premia observed, for example, in the water industry.

Our estimate of the appropriate WACC range for BAA in Q5 already takes account of the possibility of a rise in the real cost of debt during Q5.

Nevertheless, we believe there is merit in exploring further mechanisms to deal with large unanticipated increases in the cost of debt within the price control period. Such a mechanism could:

- set the allowed cost of debt in the WACC formula at a value towards the low end of our range for the cost of debt; and provide
- an intra-period automatic adjustment mechanism to enable adjustments to allowed revenues in the event that the actual cost of debt over the Q5 period exceeded the allowed cost of debt by a significant amount.

For example, the allowed cost of debt for Q5 might be set at 2% (higher than the current actual cost of A-rated debt and equal to the low end of our range) with provision for mechanistic adjustment in the event that a transparent debt market benchmark increases more than a specified amount. The specified amount might be, say, 50 basis points more than the difference between the actual cost of debt at the start of Q5 and 2%. Should the actual cost of benchmark debt rise by more than the specified amount the company would be automatically entitled to higher allowed revenues to allow for the increase in the actual cost of debt over the allowed cost of debt.

Transparent, non-controllable indicators of the cost of rated debt are readily available. This sort of transparent, automatic adjustment mechanism would keep user charges lower than they would otherwise be, for so long as the low cost of debt available in the markets continued. However, should debt markets tighten, debt providers would know that there would be a compensating adjustment to BAA's allowed revenues and so BAA would still be able to raise the additional debt it needed to finance its investment programmes, potentially at lower cost because of the partial interest rate hedge.

In its May Policy Update document CAA raised some concerns about the use of interest rate triggers. These are valid concerns that would need to be addressed in the design of any such trigger mechanism. However, we are confident that those concerns can be addressed with careful design. Here we set out some initial thoughts on the points raised by CAA.

- *Increased uncertainty to returns to investment*. This will depend in part on whether an asymmetric or symmetric trigger was adopted and also on the way in which projects were funded. However, in principle a mechanism that hedges interest rate risk is likely to be seen as reducing uncertainty about returns, giving a better match between the cost of debt and allowed revenues to service the debt and potentially reducing the debt premium and cost of debt slightly.
- *Risk of undermining the properties of incentive regulation*. We do not believe that this is a material concern. A trigger of this sort is entirely consistent with incentive based regulation, which has the basic concept that companies should bear and be rewarded for managing risks that are under the company's control. The risk-free rate and debt premia for rated bonds are clearly outside the control of the company and cost of debt benchmarks are not subject to control by BAA.

- *Have implications for efficient financial structure and embedded debt.* Any effects here would depend on the exact design of the trigger. We are confident that mechanisms can be developed to address these concerns.

The potential benefits of setting the allowed cost of debt closer to the actual cost of debt over Q5 in terms of lower charges for airport users are potentially considerable. The concerns expressed by CAA should be viewed in that context.

6.3. Differential WACCs for the London airports

6.3.1. Background – Q4

In its recommendations to the CC on the Q4 price caps, the CAA proposed different WACCs for the three BAA London airports. This was, it said, to reflect the different levels of investment and risk faced by the three airports. Under a single-till approach the CAA proposed a pre-tax WACC of 7.0% for Heathrow and a slightly higher pre-tax WACC of 7.5% for both Gatwick and Stansted.

The source of this variation was the different equity betas CAA used in it's calculation for the airport specific WACCs. It assessed Gatwick and Stansted as having an equity beta of 0.8, whilst Heathrow to have a lower beta of 0.7. The CAA was quite explicit in its reasons for proposing this difference:

"…Heathrow faces less risk, as traffic tends to move from other airports, like for example Gatwick, to Heathrow, when given the opportunity. It seems clear that Heathrow is the preferred airport for many airlines. Therefore, volume risk is likely to affect Heathrow less than for example Gatwick and Stansted. Due to its high concentration of low cost carriers, it could be argued that Stansted is less likely to suffer volume risk than Gatwick: even in the case of a downturn Stansted is likely to attract a considerable amount of (business) travellers due to its low cost carriers. Nevertheless, Stansted is relatively small and this should maybe also be taken into account."

Source: CAA (2002), Cost of Capital annex, p28

The CC, however, chose not to follow CAA's approach citing the integrated nature of BAA's activities and centralised financing arrangements[38] as reasons not to disaggregate the airports' beta. It assessed BAA to have a company wide equity beta in the range of 0.8 – 1.0 and single WACC of 7.75%.

In its final determination the CAA affirmed its view that it was appropriate and achievable to apply differential WACCs to the London airports given the different risk profiles faced by the airports and the availability of airport specific revenue and traffic composition figures enabling an estimation of the degree of differential risk across airports. Whilst it maintained its initial view that Heathrow faced less demand volatility in general terms, it amended its thinking on the risks (both in terms of capex and passenger numbers) associated with the T5 project. When the T5 risks were viewed in conjunction with the lower demand risk in general the CAA decided that, on balance, it

[38] See CC (2002) paragraph 4.64

was appropriate to apply the same equity beta to Heathrow as for Gatwick and Stansted leading to a single system wide WACC.

6.3.2. Q5 approach

CAA has indicated that it is exploring the use of separate WACCs again for Q5[39]. We share CAA's view that using differential WACCs as part of separate regulation of the airports is more likely to provide economically efficient investment incentives than a system wide approach.

BA's response to the December consultation document set out views on how CAA might seek to estimate the differential WACCs. In summary, the most practical approach to this is likely to start with a BAA wide cost of capital (as we have done in this paper) and then moves on to consider what the differential systematic risks are across the airports. Any inter-airport variation is likely to manifest itself in the airports' βs and debt premia. Consistent with our approach to gearing and tax CAA should also take account of different 'optimal' gearing and 'actual' tax for each airport.

We have not carried out analysis at this stage to provide an estimate of differential WACCs at the London airports. However, we note that there are good reasons to think that the key non-diversifiable risk – demand risk – is lower at Heathrow than any of the other airports, particularly Stansted. The reasons were set out clearly by CAA itself – its 2002 report cited above. They remain valid.

We note that BAA has argued in its response to the December consultation paper that, if differential WACCs are used, it would not be appropriate to adjust each cost of capital downwards to reflect the benefits of cross-ownership, and corporate financing of the three London airports[40]. In response CAA has indicated that they will consider how far financing costs should be treated differently from other types of costs that can be shared across airports to the benefit of users, and that their assessment of the cost of capital may have regard to the common ownership of BAA's London airports.

We agree with the CAA's approach. In particular, we note that BAA's argument is inappropriate in the current situation - in which the regulated airports are not ring-fenced from BAA's non-regulated businesses. For example the debt issued to finance the Budapest acquisition was secured on the cashflows of the regulated businesses. We believe that BAA's argument is clearly a case of 'having its cake and eating it' – since it benefits from cross ownership in its actual financing of non-regulated assets[41].

[39] Para 9.62 Policy Update, CAA, 15th May.

[40] Para 9.26 Policy Update, CAA, 15th May.

[41] BAA may also benefit from cross ownership in the flexibility that it has to charge the airports for overheads and other costs.

APPENDIX A. DEFINITIONS OF WACC

Introduction

This Appendix sets out the various, alternative definitions of the WACC and provides an illustrative, worked example that demonstrates that correct application of each approach gives different headline WACC values, but results in the same allowable revenue.

Definitions of the Cost of Capital

When comparing allowed CoC values across countries and sectors – and over time – it is important to be clear about the basis on which the values have been calculated . There are at least three distinct formulations of the WACC (see figure below).

The post-tax vanilla WACC is the average cost of debt and equity after tax. Multiplied by the RAB it determines the amount of allowed revenues required to compensate providers of capital net of corporate tax payments. If the post-tax vanilla WACC concept is used to determine allowed revenues relating to the CoC then, in addition, allowed revenues must include additional provision for taxation costs expected to be paid in the price control period computed taking account of the deductibility of debt interest payments.

The post-tax WACC net of debt tax shield directly adjusts for the tax deductibility of debt interest payments. If this concept is used then the allowed revenues relating to taxation costs should be computed, assuming no further tax deductibility of interest payments (to avoid double counting).

The pre-tax WACC 'grosses up' the post-tax WACC. If this concept is used then allowed revenues in respect of the CoC have already taken full account of taxation costs and interest deductibility and no further allowed revenues relating to taxation costs should be included.

Figure A.1: Three concepts of the WACC

Post-tax 'vanilla' WACC – WACC(PV)
WACC(PV) = CoE . (1-g) + CoD . g where CoE and CoD are, respectively, the estimated cost of equity and cost of debt before taking account of the tax deductibility of debt interest payments and g is the gearing ratio
Post-tax WACC net of debt tax shield – WACC(NTS)
WACC(NTS) = CoE . (1-g) + CoD . g . (1-t) where t is the corporate tax rate and the other terms have the same meaning.
Pre-tax WACC – WACC(pre-T)
WACC(pre-T) = CoE . (1-g) / (1-t) + CoD . g where the terms have the same meaning as above.

Price basis

The WACC can be calculated and reported in either real terms (i.e. excluding the effects of inflation) or in nominal terms (i.e. including the effects of inflation). When the RPI-X price cap approach is being used, the assessment of allowed revenues must be undertaken in real terms because the formula separately takes account of the funding requirement arising from price inflation.

If the WACC estimate is made and reported in nominal terms it is converted to real terms using the formula:

$(1+WACC\%_{nominal}) = (1+WACC\%_{real}) * (1+ \text{inflation rate}\%)$

When estimating the WACC, it is important to be consistent using either nominal CoD and CoE and deflating the nominal WACC to real terms; or deflating all CoC parameters and computing the WACC in real terms.

Worked example

This section provides a numerical example of the computation of the WACC using the three formulations discussed above:

- Post-tax 'vanilla' WACC
- Pre-tax WACC
- Post-tax WACC net of tax shield

Figure A2.2: Acronyms and assumptions

Acronyms	**Assumptions**
AR = Allowed revenue	RAB = 1000
ACOC = Allowed revenue for CoC	D = E = 500
T = Tax payable (allowing for interest tax shield)	D / RAB = E / RAB = 50%
D = Debt	Allowed operating cost (OC) = 100
E = Equity	Allowed depreciation (DEP) = 50
PV = Present value	Tax rate (t) = 30%
NTS = Net of tax shield	Cost of debt (CoD) = 5%
	Cost of equity (CoE) = 7%

Post-tax 'vanilla' WACC

AR = OC + DEP + T+$ACOC_{PV}$

$ACOC_{PV}$ = CoD * D + CoE * E

= 5% * 500 + 7% * 500

= 60

$WACC_{PV}$ = 60/1000 = 6%

T = (AR – OC – DEP – COD. D) . t

= (T + $ACOC_{PV}$ – COD . D) . t

Rearranging terms:

T (1-t) = ($ACOC_{PV}$ – COD . D) . t

Therefore :

T = [($ACOC_{PV}$ – COD . D). t] / (1-t)

= (60 - 25) . (0.3) / 0.7

= 15 (equals tax paid)

Therefore :

AR = 100 + 50 + 15 + 60 = 225

Post-tax net of interest tax shield WACC

AR = OC+ DEP + T1 + ACOCNTS

Where T1 is allowable revenue for tax using WACCNTS

ACOCNTS = COE . E + COD . (1 – t) . D = 52.5

WACCNTS = 5.25%

T1 = (AR – OC – DEP) . t

= (T1 + ACOCNTS) . t

= ACOCNTS . t / (1-t)

= 22.5

AR = 100 + 50 + 22.5 + 52.5 = 225

Pre-tax WACC

AR = OC + DEP + ACOCPRE-T

ACOCPRE-T = COE . E / (1 – t) + COD . D = 75

WACCPRE-T = 7.5%

AR = 100 + 50 + 75 = 225

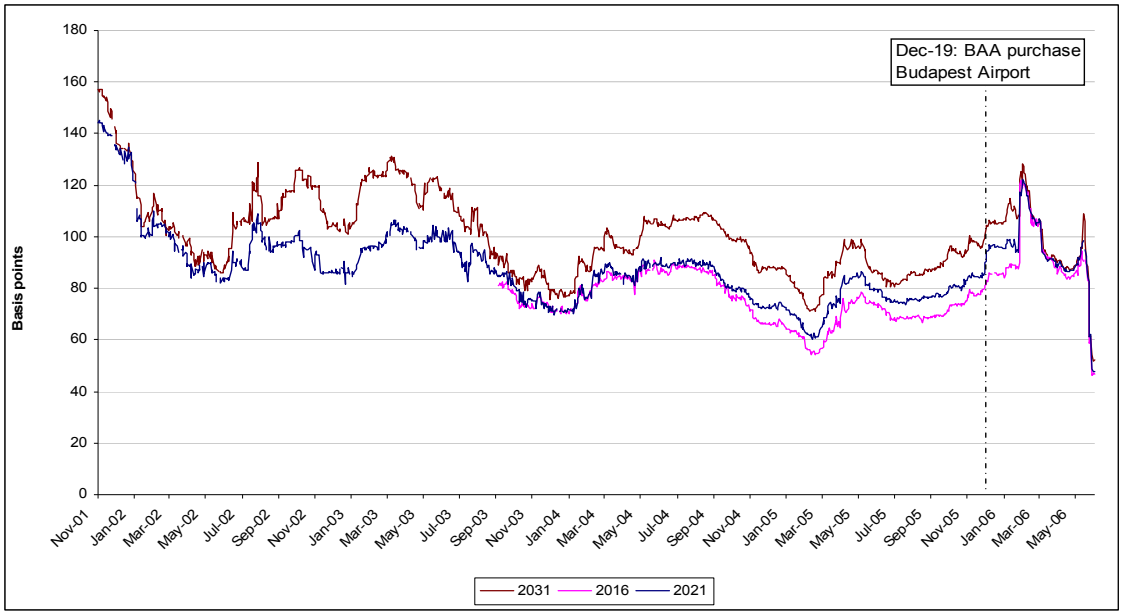
Note all these definitions give the same allowed revenue if the effective tax rate equals the statutory tax rate and the assumed gearing equals the actual gearing. However, the WACC 'headline' rate differs – plain vanilla in this example is 6%, e.g. if a debt tax shield WACC is 5.25% and pre-tax WACC is 7.5%.

APPENDIX B DEBT AND GEARING

BAA Debt

Figure B.1 shows spreads on three BAA bonds with different maturities as reported by Reuters. It shows that spreads before the acquisition of Budapest airport was averaged less than 100bp from September 2005 through to February 2006 spreads increased by around 25 basis points, reflecting, in part, the acquisition of Budapest airport. Since late February 2006 movements in spreads have largely related to the Ferrovial bid. The recent, substantial fall reflects the expectation that certain BAA bonds will need to be redeemed as part of the takeover financing arrangements.

Figure B.1: BAA spreads over gilts for selected long term bonds



Source: CEPA analysis and Reuters

Gearing and ratings in regulated sectors

Figure B.2: Gearing and ratings of a selection of regulated companies

Regulated Co.	Gearing (D/(D+E) (Book value)	Corporate Credit Rating
AWG	96.7%	A-
Northumbrian	87.2%	BBB+
BT	83.0%	A-
Nat Grid	76.0%	A
UUW	61.0%	A-
Severn Trent	60.9%	A
Kelda	56.1%	A

Source: Reuters

APPENDIX C. BAA'S EFFECTIVE TAX RATE

This Appendix illustrates the potential size of the difference between the statutory tax rate and BAA's effective rate.

Figure A3.1 below indicates the increase in the deferred tax[42] profile of BAA over the last five years. Cumulatively the deferred tax amounts to £686M by end March 2005 of which £435M is attributable to HAL.

Figure A3.1: Balance Sheet Deferred Tax Liability £M

Year end March	2005	2004	2003	2002	2001
Gatwick	119.3	114.8	112.3	114.6	95.6
Stansted	80.2	85.8	78.3	73.5	66.3
Heathrow	434.8	365.2	306.5	288.3	226.3
London airports	**634.3**	**565.8**	**497.1**	**476.4**	**388.2**
BAA	**686.0**	**624.0**	**552.0**	**504.0**	**404.0**

Figure A3.2 shows that in Q4 through to 2005 the P&L tax was £349M but the cash taxes were £215M, the difference £134M being the deferred tax.

Figure A3.2 : BAA Deferred Tax during Q4 £M

Within Q4	2004-05
Gatwick	7
Stansted	2
Heathrow	128
London airports	**137**
BAA	**134**

Figure A3.3 shows that the cash tax rate was 19.8% in 2004/05 and 16.6% in 2003/04.

Figure A3.3: Trend in BAA Tax Charge £M

	2003/04	2004/05	2003/04 plus 2004/05
PBT (ordinary activities)	536	637	**1,173**
P&L Tax (ordinary activities)	161	188	**349**
Deferred tax in year	72	62	**134**
P&L tax rate	30.0%	29.5%	**29.8%**
Effective tax rate	16.6%	19.8%	**18.3%**

The main reasons for the difference between BAA's P&L and Cash Taxes are:

[42] Deferred tax being the difference between tax accrued on the P&L statement for book accounting purposes and that actually paid in cash taxes

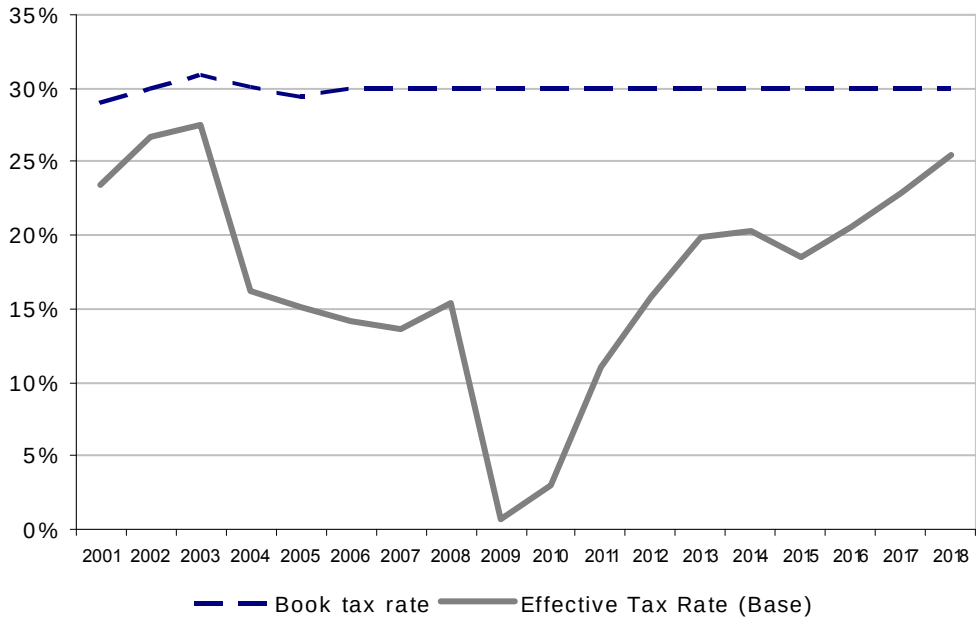
- **Excess of capital allowances over depreciation**: assets classified as plant and machinery generally qualify for tax depreciation at a 25% declining rate - this is significantly accelerated compared to book depreciation for the same assets, which as per BAA's depreciation policy are in a range from 7-20 years. This impact will reverse out with time for any one particular investment (tax depreciation will decline and ultimately annual book depreciation will overtake tax depreciation) but the impact at the aggregate BAA level will tend to grow since successive, larger, investments cause new deferred tax impacts that mask the reversal of prior investments. It will take a long period of relatively low investment before the tax rate recovers to 30%.

- **Interest during construction**: interest allocated to major construction projects such as T5 is capitalized for book income purposes but is generally expensed for UK tax purposes, provided the interest has been paid to the lender. This is also a timing effect – the interest capitalised under book income is depreciated with the underlying asset and therefore will reduce the book tax over time.

  Historically this has not been a major factor, but with long duration construction projects such as T5 the impact of this effect has recently been material – for example in 2004/05 tax relief for interest capitalized saved BAA £36M in tax payments.

These two impacts are likely to continue with a continued growing gap between taxable and book income due to the above factors. Using BAA's latest projections for capital, Figure A4.4 provides an estimate of how the effective tax rate may change over Q5 and Q6. These should not be regarded as forecasts. We would be happy to provide more detail on these estimates in due course should that be appropriate.

Figure A4.4: Illustration of BAA's effective tax rate



Source: CEPA analysis and BAA annual reports

APPENDIX D. SOURCES OF DATA AND METHODOLOGIES

Risk free rate

In reaching our assessment on the real risk free rate in section 3.2.1, we have used data sourced from the Bank of England. In particular, yields on UK Index Linked Government Bonds (Gilts) on a daily basis.

This can be found at, http://www.bankofengland.co.uk/statistics/yieldcurve/ .

Debt premium

In our assessment on the debt premium for BAA we have made use of UK investment grade spreads on 20 year bonds (Figure 3.4). These were calculated by taking the difference between the yields on AAA, A and B rated 20 year bonds as supplied by Reuters (datasets AAAGBP20Y, AGBP20Y and BBBGBP20Y), and the yield on 20 year British Government securities with a nominal zero coupon (dataset IUDLNZC) available on the Bank of England website.

Beta

Our estimation of BAA's beta is partly based on data provided the London Business School's Risk Management Services (RMS). A precise definition of the methods and data are given in Marsh & Dimson, *Estimation Methods Used in the Risk Measurement Service* available from the LBS. We provide brief details below.

The risk measures are estimated using five years of monthly data on month-end security prices (the marked price on the last day of the month, from the Stock Exchange Daily Official List), and on index levels (the Financial Times – Actuaries All Share Index). The returns, including dividends, are converted to a continuously compounded basis.

Betas are estimated using a variant of the market model (adjusted for heteroscedasticity), and is based on regressing trade-to-trade returns on the market returns observed over the identical intervals of time. The raw risk measures are then Bayesian adjusted for the beta and its standard error.

CEPA Modelling

As part of our analysis we have developed a high-level financial model of BAA, HAL, GAL and STAL. This model uses figures from 2004/05 audited accounts and regulated accounts of BAA and the London airports to project forward. The projections reflect assumptions drawn from a range of sources. It is important to note that model has been developed for illustrative purpose from publicly available information. CEPA provides no warranty as to the correctness of the results of the model.

APPENDIX E. REFERENCES

BAA, *'Stay with BAA'*, 3 May 2006

BAA, *'Stay with BAA – Four Steps to Value'*, 25 May 2006

CAA, *'Heathrow, Gatwick and Stansted Airports' Price Caps, 2003-2008: CAA recommendations to the Competition Commission'*, March 2002

CAA, *'Economic Regulation of BAA London Airports (Heathrow, Gatwick and Stansted) 2003 – 2008 CAA Decision'*, February 2003

CAA, *'Airports review – policy update'*, May 2006

CAA, '*Economic Regulation of Airports – General Guidance',* June 2006

Competition Commission, *'Cellnet and Vodafone: Reports on references under section 13 of the Telecommunications Act 1984 on the charges made by Cellnet and Vodafone for terminating calls from fixed-line networks'*, 1999

Competition Commission, *'BAA plc: A report on the economic regulation of the London airports companies (Heathrow Airport Ltd, Gatwick Airport Ltd and Stansted Airport Ltd)'*, 2002

Dow, J. (2002). Comments on the CAA Proposed Q4 Decisions for BAA's London Airports, *British Airways submission to CAA*

Fama, E., and French, K. (1989). Business conditions and expected returns on stocks and bonds, *Journal of Financial Economics*, 25, 23-49

Franks, J., and Mayer, C. (2003). Critique of Professor Dow's Paper on BAA's Cost of Capital, *BAA submission to CAA*

Ofcom, *'Ofcom's approach to risk in the assessment of the cost of capital: Final Statement',* 2005

Ofgem, '*Electricity Distribution Price Control Review: Background Information on the Cost of Capital*', March 2004

Ofgem, '*Electricity Distribution Price Control Review: Final Proposals*', November 2004

Ofwat, '*Future Water and Sewerage Charges 2005-10: Draft Determinations*', August 2004

Ofwat, '*Future Water and Sewerage Charges 2005-10: Final Determinations*', December 2004

OXERA, '*The Capital Structure of Water Companies*', commissioned by Ofwat, October 2003

Palmer, K., and Nixon, H. (2005). Financing the water industry: lessons from PR 04, *Agenda,* July 2005

PricewaterhouseCoopers, *'NATS -Cost of Capital for CP2'*, November 2004

Standard & Poors, *'European Airport Credit Survey'*, November 2005

Wright, S., Miles, D. and Mason, R. (2003). A study into certain aspects of the cost of capital for regulated utilities in the UK, *Smithers & Co (the 'Smithers report' or 'Smithers and Co')*. Commissioned by the UK regulators (the CAA, Ofwat, Ofgem, Oftel, ORR, Ofreg) and the Office of Fair Trading