

Response to initial proposals: cost of capital (addendum)

Note prepared for Gatwick Airport Ltd

August 14th 2013

1 Introduction

This note builds on the issues raised in the response¹ to the initial proposals (IPs) and the recent helpful meeting between the CAA, PwC, Gatwick, and Oxera. The note provides constructive commentary on the details of the analysis supporting the IPs, and suggests a number of modifications, specifically on the topics of asset beta, the cost of debt, and skewness.

2 Asset beta

Oxera believes that the asset beta of Gatwick is higher than 0.52, which was the assumption used in Q5. Oxera modelling suggests a range of 0.60–0.65, which is 15–25% higher than the Q5 estimate.² The higher traffic volatility seen since 2008 compared with the conditions around the time of the Q5 Gatwick determination is consistent with this increase in risk exposure.

An asset beta of 0.60–0.65 would position Gatwick at the top of the range of asset betas estimated by PwC for listed airports.³ However, there is no reason to constrain the asset beta to this group as Gatwick is likely to have higher systematic risk exposure than these comparators. This risk assessment is based on Oxera's detailed benchmarking exercise to identify airports that face similar operational and regulatory characteristics to Gatwick.⁴ For example, Paris-Orly and Rome Fiumicino were identified as comparators to Gatwick, but

¹ Oxera (2013), 'Response to initial proposals: cost of capital', prepared for Gatwick Airport, June 24th.

² Oxera (2013), 'What is the cost of capital for Gatwick Airport beyond Q5?', methodology and estimation, prepared for Gatwick Airport, January 31st.

³ PwC (2013), 'Estimating the cost of capital in Q6 for Heathrow, Gatwick and Stansted—a report prepared for the Civil Aviation Authority (CAA)', April.

⁴ Oxera (2013), 'Regulatory regimes at airports: an international comparison', prepared for Gatwick Airport, January 23rd.

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these airports do not have stand-alone equity market listings. As the listed parent companies contain other businesses that are likely to be relatively low risk (eg, Charles de Gaulle in the case of Aéroports de Paris, and electricity production in the case of Aeroporti di Roma), Paris-Orly and Rome Fiumicino would be likely to have higher asset betas if listed separately from their parent companies.

To the extent that listed airport group betas can be relied upon, they are more likely to match the risk profile of the pre-break-up BAA Group or of Heathrow. However, these comparators are an imperfect way to measure the risk of Designated Airports (as recognised by PwC⁵). In addition, the robustness of the data is affected by measurement issues, including the small sample size, the shortage of estimates for stand-alone airports, illiquid equity, and different national benchmark equity indices. Moreover, no listed airport has recently experienced structural changes as significant as those at Gatwick, and therefore if the asset betas of the listed comparators are poor measures of the level of asset beta for Gatwick, they will be even worse measures of the changes over time in the asset beta.

There are two main channels for structural changes in risk at Gatwick:

- greater competition between airports;
- redistribution of risk from airlines to airports.

There is now more competition between airports. The break-up of BAA has been a major factor, but there is also competition from other UK and non-UK airports. This creates more opportunities for traffic to switch between airports. This is a first-order effect of competition, which is a diversifiable risk.

There are also second-order effects because competition reduces pricing power and profitability. Taken to the extreme, competition between airports could push prices down to the short-run marginal cost (SRMC), which would be unsustainable in the long run. Less extreme increases in competition will still reduce the ability of airports to achieve sufficient margin over SRMC to recover the value of the regulatory asset base (RAB).

When different scenarios for the strength of demand are considered, the increase in competition means that, under a larger proportion of these scenarios, airports will be unable to price up to the cap. This is because a negative systematic demand shock will see airports compete more aggressively to offer discounts in an attempt to maintain traffic volumes. In this negative demand shock scenario, system-wide profits will be lower, the more intense is competition. This greater sensitivity of profits to systematic shocks is why the weighted average asset beta across Heathrow, Gatwick and Stansted post break-up is higher than the BAA asset beta. Given Gatwick's traffic mix, competition is likely to bear more heavily on Gatwick than the other airports, and therefore the impact of competition is likely to be concentrated in an increase in asset beta for Gatwick more than for Heathrow or Stansted.

There is also the redistribution of risk from airlines to airports. Airlines have demonstrated a greater willingness and ability to reallocate capacity between airports in order to maintain more stable load factors. Since landing charges contain a mixture of aircraft and passenger charges, these more flexible business models have made the cost bases of airlines more variable, and hence have increased the sensitivity of airport revenue to economic fluctuations. Low-cost carriers have been particularly aggressive in their use of more flexible business models. As Gatwick's exposure to these carriers increased from 32% to 52% between 2007 and 2012, it has been particularly exposed to this redistribution of risk.⁶

⁵ PwC (2013), op. cit., p.65.

⁶ Oxera (2013), 'What is the cost of capital for Gatwick Airport beyond Q5?', methodology and estimation, prepared for Gatwick Airport, January 31st, Figure 2.3.

In light of these significant structural changes, it is implausible that there has been zero increase in the systematic risk exposure and hence asset beta of Gatwick since the Q5 decision. The changes since the Q5 determination mean that the airport now faces a much wider range of commercial scenarios, which could not have been considered by either investors or the CAA/Competition Commission when determining the Q5 beta assumption based on share price data for BAA Group (not Gatwick directly) up to January 2006. It is appropriate to reflect these changes through a higher asset beta assumption than used in Q5.

3 Cost of debt

Oxera believes that the cost of debt for Gatwick in Q6 under a notional, efficient financing structure will be higher than 2.9%, which is the result of applying the CAA's 75th percentile point estimate to the PwC range of 2.35–3.05% for the cost of debt. The analysis of Gatwick's cost of debt appears to have been undertaken at an unnecessarily high level, which has resulted in no differential between the cost of debt for Heathrow and Gatwick, and a weighted average cost of capital for Gatwick that is lower at 55% gearing than it would be at 60% gearing.

This calculation consists of the following components:

- the cost of existing debt;
- the cost of new debt;
- the weighting of the existing and new debt;
- an allowance for issuance costs.

While Oxera agrees with the midpoint of the range estimated by PwC for the cost of existing debt, we disagree with the estimation approach. Refinements to the approach will narrow the range. However, the PwC range for the cost of new debt is a significant underestimate, and the weighting of new debt in the overall cost of debt is significantly overstated. A number of refinements to these components are possible and necessary, as described below. These adjustments would lead to a cost of debt of 3.15–3.25% for Gatwick.

Cost of existing debt

Oxera estimated the real cost of Gatwick's existing debt to be 3.0% based on a weighted average of issuance yields across Gatwick's four bonds (6.0% nominal), deflated by an inflation assumption of 2.9%. PwC has estimated the cost of Gatwick's existing debt based on issuance yields of bonds issued by both Heathrow and Gatwick over the period since January 2008, which generated a range of 5.3–6.3% nominal and 2.5–3.5% real based on PwC's inflation assumption of 2.8%. This approach is inappropriate for the following reasons.

- The range combines bonds issued by both Heathrow and Gatwick. However, Gatwick has a lower credit rating and higher spreads than Heathrow, despite lower gearing than Heathrow. This factor underestimates the cost of debt for Gatwick's risk profile.
- As the range is defined by bonds of different maturities, the shape of the yield curve and the maturity premium is likely to be the main driver of the range—5.3% is an average based on bonds of less than five years' maturity; 6.3% is based on bonds of more than 15 years' maturity. As at January 2013, the weighted average period to maturity of Gatwick's bonds was 19 years, with the first bond due for repayment in 11 years. This factor underestimates the cost of debt for Gatwick.
- The period for the PwC analysis extends back to the time before Gatwick was sold, and hence includes data from a period before Gatwick could issue debt on a stand-alone basis. This captures a period of high yields during the financial crisis, which is not a relevant period for Gatwick's cost of existing debt. Therefore, this factor overstates the

cost of existing debt for Gatwick and offsets the underestimation of the cost of debt that results from the two factors already discussed.

In summary, the following refinements to the PwC approach are necessary:

- reflect a risk profile that differentiates between the individual characteristics of Gatwick and Heathrow;
- include an appropriate maturity premium in the estimate, rather than using the maturity premium as a component of the cost of debt range;
- use a time period for the analysis that is consistent with when Gatwick was able to issue debt on a stand-alone basis.

These refinements would be expected to yield a narrower range for the cost of Gatwick's existing debt, albeit with a similar midpoint to the initial proposals.

Cost of new debt

Oxera estimated that any new debt issued by Gatwick during Q6 would be likely to be issued at around 6.0% nominal yield, consistent with the long-term average of the BBB corporate bond index.

PwC estimated the cost of new debt based on two approaches.

- Spot yields of A- and BBB-rated corporate bond indices, uplifted by 60bp to reflect a premium of 100bp of forward gilt rates over spot rates (tempered by an assumption that corporate bond spreads would tighten as gilt yields increase) generated a range of 4.4–5.0% nominal.
- Spot secondary market yields on Heathrow and Gatwick bonds generate a range of 3.6% (Heathrow bonds) to 4.4% (Gatwick bonds), which becomes 4.2–5.0% when the 60bp uplift is applied. Although there is an 80bp yield premium on the Gatwick bonds relative to Heathrow, the same range has been applied to both airports.

PwC has combined the two approaches and narrowed the range to 4.4–4.9% for the cost of new debt, which becomes 1.6–2.1% real when combined with PwC's inflation assumption of 2.8%. Oxera has the following concerns with this approach.

- The bottom of the range is based on an A rated corporate bond index and Heathrow bonds (Heathrow senior bonds are rated A–). Gatwick bonds trade at a significant yield premium to Heathrow bonds—80bp based on PwC analysis—which reflects the lower credit rating and higher risk of Gatwick despite lower gearing than Heathrow. This factor underestimates the cost of debt for Gatwick's risk profile.
- Yields on Gatwick's bonds have increased by approximately 10–30bp since the cut-off date for PwC's analysis, and the weighted average traded yield for Gatwick's bonds is currently approximately equal to the midpoint of the 4.4–4.9% range that PwC has used. The PwC range is presented after adding the premium for forward yields over spot yields to increase by 60bp. Were this premium to be added to the current spot yields on Gatwick's bond, the cost of debt would be above the PwC range.
- The forward gilt rate premium of approximately 100bp over spot rates has been reduced to a 60bp forward premium on corporate yields based on an assumption that spreads will tighten as gilt yields rise. Comparing the increase in Gatwick bond yields (between 41bp and 53bp) with the increase in gilt yields (40bp for the 20-year benchmark gilt) since the May 22nd announcement by the Federal Reserve⁷ suggests that the forward

⁷ Testimony by the chairman of the Federal Reserve to the United States Congress, which signalled an earlier-than-expected end to quantitative easing.

premium on corporate yields could be higher than on gilt yields, and that an uplift over spot yields of at least 100bp would be appropriate.

- The PwC range contains an uplift based on a central forecast for yields to rise, but there is no allowance for the uncertainty around where yields could rise to in Q6. The movements in yields since the cut-off date for PwC's analysis have been significant and this volatility is expected to continue as expectations of the slowing-down and reversing of quantitative easing continue to adjust. In light of this volatility, it would be appropriate to make an allowance for scenarios in which yields rise further and faster than markets currently expect.

Taking all the above factors into account suggests a cost of new debt of approximately 5.5–6.0% nominal or 2.7–3.2% real, based on an inflation assumption of 2.8%. This compares with the PwC estimate of 1.6–2.1% real.

Weighting of existing and new debt

Gatwick does not need to refinance bonds until 2024. As the RAB is forecast to remain broadly constant in real terms, it is unlikely that Gatwick will raise significant quantities of new debt during Q6.

The 50:50 weighting used in the IPs is the same ratio as was calculated for the Stansted Q5 price review. This was calculated by allocating BAA fixed-rate debt to Heathrow, Gatwick, Stansted and the BAA non-regulated businesses in proportion to their asset bases, which gave an average fixed-rate debt-to-RAB ratio of 25% for Stansted. As notional gearing for Stansted was assumed to be 50%, the new and variable-rate proportion of total debt was assumed to be 50%.

Applying the same approach to Gatwick for Q6 would not lead to the 50:50 weighting used in the IPs. Instead, an approach consistent with the Stansted Q5 price review would place almost all weight on the cost of existing debt. A ratio of 80:20 (or higher) for existing to new and variable-rate debt would be closer than 50:50 to the likely mixture of debt at Gatwick, and hence more consistent with the Q5 approach.

The weighting of existing and new debt is important because the PwC estimate of the cost of new debt is significantly lower than the estimate of the cost of existing debt. Based on the PwC estimates, the cost of debt would be 35bp higher with 80:20 ratio compared with 50:50 ratio.

Issuance costs

PwC has calculated an allowance for Gatwick's debt issuance fees of 20bp. This is based on separate allowances for arrangement fees, new issue premiums, and other fees such as legal costs and commitment fees, as well as an uplift for the smaller bonds that Gatwick issues compared with Heathrow. The proposed allowance is an increase relative to the 15bp allowance at the Q5 price control for Heathrow and Gatwick. This seems appropriate as Gatwick now issues on a stand-alone basis and would therefore be expected to pay higher fees as a proportion of the face value of the bonds compared with when bonds were issued by the BAA Group. There are a number of additional fees not explicitly recognised in PwC's analysis (eg, credit rating agency fees), which suggests that an overall allowance of at least 20bp would be appropriate.

4 Skewness

Oxera's analysis indicates that, in the period beyond Q5, Gatwick could face a distribution of profitability that is negatively skewed around the central forecast of the business. This is a consequence of negatively skewed outcomes for demand, and the operational leverage

generated by fixed costs and investments. An appropriate way to recognise this is by adopting a point estimate at the top end of the estimated range for the cost of capital.

The asymmetry of possible outcomes for demand reflects both the relative maturity of the aviation market and a number of capacity constraints within the London airports system.⁸ This implies limited opportunities for outturn demand to exceed forecasts. Furthermore, the aviation market is vulnerable to shocks that reduce demand significantly below forecast, even if the shocks persist for only a relatively short time. The impact of such shocks is apparent in the pattern of passenger demand at Gatwick and Heathrow. The analysis of traffic data already presented by Oxera to the CAA showed that the percentage decline in passenger numbers at Gatwick at the time of the 2008 financial crisis was larger than at Heathrow, and the subsequent recovery in passenger numbers was more muted.⁹

Moreover, skewness in profitability is not created solely by skewness in volumes—the wider range of potential commercial outcomes for Gatwick includes greater uncertainty regarding the airport’s ability to price consistently up to its cap in the period beyond Q5.

When combined with operational leverage, a negatively skewed distribution of outcomes for demand entails a negatively skewed distribution of outcomes for profitability. Negative skewness implies that downside risk exceeds the upside potential, so the market would require compensation for skewness in the form of a higher return. There is a significant body of evidence that shows that investors require higher expected returns for assets where outcomes are negatively skewed and where this skew is correlated with the economy.¹⁰

The standard capital asset pricing model (CAPM) restricts the trade-off between risk and return to two ‘moments’ of the return distribution: the mean and the variance. As such, it implicitly assumes that investors are indifferent to higher moments of the return distribution, such as the return’s skewness. While this approximation is likely to hold if the distribution of returns is more or less symmetric, adjustments need to be made if this is not the case.¹¹

In order to quantify the effect of the negative skew that is relevant to the cost of capital for Gatwick, Oxera estimated the ‘co-skewness’ coefficient for the three London airports, suggesting that returns at Gatwick are more asymmetric than at Heathrow and Stansted.¹² This implies a greater uplift to the CAPM-based cost of capital for Gatwick, to compensate for its asymmetric risk exposure, than at Heathrow and Stansted.

The asymmetry in Gatwick’s returns is also indicated by Gatwick’s underperformance against regulatory assumptions on the cost of capital every year since 2004.¹³ If Gatwick’s returns were symmetric, it would be expected to overperform in some years and underperform relative to regulatory assumptions in other years. Gatwick’s persistent under-recovery against the CAA’s assumption suggests that the distribution of revenues and profits is asymmetric.

⁸ For more details, see Gatwick Airport (2013), ‘A new deal at London Gatwick: Revised business plan to 2024’, January, section 2.2.

⁹ Oxera (2013), ‘What is the cost of capital for Gatwick Airport beyond Q5?’, methodology and estimation, prepared for Gatwick Airport, January 31st, Figure 2.2.

¹⁰ See, for example, Harvey, C.R. and Siddique, A. (2000), ‘Conditional Skewness in Asset Pricing Tests’, *Journal of Finance*, 55:3, June, pp. 1263–96; and Kraus, A. and Litzenberger, R.H. (1976), ‘Skewness preference and the valuation of risk assets’, *Journal of Finance*, 31:4, September, pp. 1085–100.

¹¹ See also Cooper, I. (2011), ‘Adjusting Heathrow’s cost of capital for skewness: Methodological and qualitative issues’, prepared for BAA for the purpose of a regulatory submission, September 30th. Cooper states that ‘[t]he correct measure to use in adjusting the cost of equity is coskewness with the market return, which allows for diversification. The adjustment increases the cost of equity when coskewness is negative and decreases it when coskewness is positive’ (p. 2).

¹² Oxera (2013), ‘What is the cost of capital for Gatwick Airport beyond Q5?’, methodology and estimation, prepared for Gatwick Airport, January 31st, Appendix 1.

¹³ Oxera (2013), ‘What is the cost of capital for Gatwick Airport beyond Q5?’, methodology and estimation, prepared for Gatwick Airport, January 31st, Figure 2.5.

Quantifying the impact of skewness on the cost of capital entails addressing a range of empirical challenges. Adopting a point estimate for the cost of capital at the top end of the estimated range is a practical way to recognise the evidence that suggests that Gatwick faces a negatively skewed range of commercial outcomes.