Comment on the split cost of capital proposal of Professor Helm, submitted by BA

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1. INTRODUCTION

1.1 I have been asked by BAA to discuss the proposal: "The split cost of capital and utility regulation with particular reference to airports", dated 5 December 2011, by Professor Dieter Helm (Helm (2011)).

1.2 Professor Helm's proposal is that the cost of capital of an airport should be split into two parts, one related to the regulatory asset base ("RAB"), and the other related to future capital expenditure ("CAPEX") and operating expenditure ("OPEX").

1.3 Professor Helm's proposal covers the use of his approach as an aid to estimating the cost of capital and it is also a proposal to change the regulatory framework itself. The proposal contains at least four elements which imply a structural change to the regulatory framework:

- A change to indexing the cost of debt year-by-year rather than using a cost of debt which applies to the entire regulatory cycle (Helm (2011) page 2 points 8-11);

- A change to the regulatory contract whereby: (a) the regulator guarantees the RAB, and hence there is no equity risk for that aspect of the business (Helm (2011) page 12) and (b) incentives are intentionally changed (Helm (2011) page 19 and page 2 point (6));

- Abandonment of "the WACC approach" (Helm (2011) page 21);

- A structural change to the conduct of an airport business, whereby assets are "sold" between the "RAB business" and the "CAPEX and OPEX" business (Helm (2011) pages 9-10).

1.4 Any of these changes to the structure of regulation would change the incentives of airport operators in significant and complex ways. The regulatory system involves a balance of such incentives with risk-sharing between capital markets and customers. These considerations are beyond the scope of this report and are not addressed in detail in Professor Helm's report. In this report I discuss only the narrower issue of whether Professor Helm's proposal is likely to assist in estimating the cost of capital of a regulated airport given the current regulatory framework.

1.5   In my opinion, it is important to separate two issues: (1) What will happen to the cost of capital under the split cost of capital approach if there is no change to the regulatory contract? and (2) Will the cost of capital change if the regulatory contract changes as part of the implementation of the split cost of capital approach?

1.6   Regarding (1), if there is no change in the regulatory contract, the split cost of capital approach should not change the cost of capital. If the regulatory contract does not change the overall amount of risk borne by the airport operator the asset beta of the business should not change since splitting a given amount of risk does not change the overall amount of risk. The asset beta determines the overall cost of capital. Therefore, the cost of capital should not be changed by the approach if it does not change the regulatory contract.

1.7   Regarding (2), for the split cost of capital approach to change the overall cost of capital, it would have to be accompanied by changes to the regulatory contract. To reduce the cost of capital as Professor Helm asserts, these would have to materially reduce (or eliminate) risk to the RAB without affecting other risks. Indeed, funding the RAB entirely with debt would require all risk to be eliminated. In that case, the change in the cost of capital would come not from the split cost of capital approach itself, but from the change in the regulatory contract.

1.8   For instance, if the Government were to give a perpetual guarantee of the value of the RAB (as implied in Helm (2011) page 12) it could materially reduce the risk to the airport operator by transferring risk to the Government. The split cost of capital approach would then be one way of estimating the effect of this risk transfer on the cost of capital of the airport operator. However, the most direct way to do this would be to evaluate the risk transfer from the company to the Government and adjust the cost of capital directly for this, which would not require the split cost of capital approach. Also, this risk transfer would change the incentives of the operator. A correct evaluation of the overall effect of the changed regulatory contract would then depend on the balance of effects of the risk transfer on the cost of capital, the cost of the Government guarantee, and incentives.

1.9   The issue I have been asked to address is issue (1): whether Professor Helm's particular version of the split cost of capital approach is likely to give a better estimate

of the cost of capital of a regulated airport than more conventional approaches. Section 2 discusses the regulatory context of the proposal. Section 3 covers theoretical issues regarding the approach. Section 4 discusses some issues that would arise if the procedure were adopted for BAA, and Section 5 gives the conclusions.

2.   REGULATORY CONTEXT

2.1   The proposal for a "split WACC" is not new. It has been proposed in a previous round of regulatory price-setting, and rejected by the Competition Commission ("CC"):[1]

> *"7. The only new methodological issue that we considered in this review was the concept of a split cost of capital as recently developed by Professor Dieter Helm of the University of Oxford. Professor Helm had last year been critical of our decision to use a single rate of return in the calculation of price caps for Heathrow and Gatwick airports,[1] arguing that it is better for a regulator to apply different rates of return to the RAB and to on-going opex and capex. His proposition, in its original form, is that a regulated income stream combines two very different types of cash flow:[2]*
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> *(a) the return of and on the RAB, where risk is (very) low so long as the regulator commits to including the costs of historical investment in future price controls; and*
>
> *(b) payment for on-going opex and capex, where risks are considerably higher.*
>
> *8. In Professor Helm's view the RAB has a low cost of capital and the capex and opex have a high cost of capital, and these distinct costs of capital should be reflected in a regulator's price cap calculations via a split rate of return.[3]*
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> *9. Members of the CC's Cost of Capital Panel met with Professor Helm during our review to make sure that they had properly understood Professor Helm's ideas and to discuss with him some of the questions that they had about his proposals. The main difficulty that they had with the split cost of capital framework was the idea that Stansted's revenues could somehow be separated into two component parts with very different risk profiles. In practice, airlines pay*

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[1]Competition Commission, Stansted price control review: Final report, Appendix L, Cost of capital, paras 7-12.

one set of regulated charges, capped according to a formula set by the CAA, and an airport delivers one overall profit to one set of investors—a return that, by definition, varies according to all the risk factors that Professor Helm has identified.

10. This regulatory design means that the return that investors earn on historical investment (as reflected in the RAB) is inextricably linked to the demand at the airport, the cost of operating, maintaining and renewing built assets, and the on-going service quality provided to customers. The convention of using the RAB as an input into the calculation of price caps gives investors the opportunity to recoup their investments, but deliberately puts that return at risk (i.e. it is conditional upon the efficient and competent operation of the assets that are built). As such, it is entirely conceivable (and, indeed, desirable) that the actual return on the RAB will turn out to be higher or lower than the expected return seen in the WACC x RAB calculation.

11. Professor Helm was not able to persuade Panel members that the return of and on Stansted's RAB is somehow 'safe' and capable of being disentangled from an airport's performance against its price cap, or that the financiers of historical investment included in the RAB would not see the value of their capital increase or diminish in line with the fortunes of the regulated business. As a consequence, it was not appropriate for us to use a split cost of capital in this review.

12. The analysis that follows is for a single rate of return which is to be applied to both the existing RAB and new capex.

[1] *Helm (2007), How Not to Regulate Airports: BAA, the Competition Commission and Regulatory Reform.*

[2] *A fuller description of Professor Helm's split cost of capital proposition can be found in Helm (2006), Split Cost of Capital, Indexed Cost of Debt and Longer Periods: A Reply to Critics.*

[3] *In subsequent papers, Professor Helm has gone on to argue that the opex/capex activities should be put to competitive tender. This proposition is beyond the scope of this review and we do not consider it further.* "

2.2   I agree with the CC's conclusion that the idea of splitting the revenues of a UK airport into two parts using Professor Helm's approach is not likely to be helpful in practice. As the CC says: *"In practice, airlines pay one set of regulated charges, capped according to a formula set by the CAA, and an airport delivers one overall profit to one set of investors—a return that, by definition, varies according to all the risk factors that Professor Helm has identified."* In addition to the CC's objections I believe that there are two other important issues with the approach.

2.3   First, a split cost of capital should not change the asset beta estimate, as Professor Helm assumes, unless other changes are made to the regulatory contract. Notionally splitting a firm into two parts should give asset betas for the two parts which, if they are averaged together in the correct way, have the same asset beta as the whole firm. Therefore, Professor Helm's contention that his split will result in a different asset beta is inconsistent with this standard result.

2.4   Second, methods which rely on split cost of capital relationships are commonly used in UK regulation. The standard asset beta and weighted average cost of capital (WACC) formulae are examples, as is the divisional cost of capital formula which is sometimes used. Formulae which relate operating leverage to asset beta also rely, either explicitly or implicitly, on a split cost of capital approach. Hence the issue is not whether a split cost of capital approach has merit, but whether Professor Helm's particular version of the split cost of capital approach is likely to assist in estimating the cost of capital over and above these standard approaches.

3.   THEORETICAL ISSUES REGARDING THE APPROACH

Examples of formulae which are based on split discount rates

3.1   There are several common examples where split discount rates are used in practice. The WACC formula is, essentially, a split discount rate approach. It weights together the different costs of debt and equity of a firm:

WACC = Weight of debt*Cost of debt + Weight of equity*Cost of equity (1)

The weights used are the market value proportions of debt and equity, and the costs of debt and equity reflect their risks. This formula represents the way that the overall cost of capital of the firm is split between lower risk debt and higher risk equity. It is

commonly used to estimate the WACC of the firm based on the costs of debt and equity observed in the marketplace, since the WACC is not itself directly observable.

3.2   Another version of the WACC relationship is the asset beta relationship:

Beta of assets = Weight of debt*Beta of debt + Weight of equity*Beta of equity   (2)

This relationship is commonly used to infer the beta of an entire firm (the asset beta) from the observable betas of its debt and equity. It has the same motivation and justification as the WACC formula and splits the overall operating risk of the firm (asset beta) between low risk debt and higher risk leveraged equity.

3.3   Equations (1) and (2) are also related to the releveraging formulae used to convert an observed cost of equity or equity beta to a different amount of leverage. The equity beta corresponding to an amount of debt D and equity E is given by (Brealey et al (2011) page 512)):

Beta of equity = Beta of assets + (D/E) (Beta of assets - Beta of debt)   (3)

3.4   This type of releveraging formula is based on the assumption that the asset beta of the firm does not change as financial leverage changes. Using Equation (3) one can derive the equity beta or cost of equity which corresponds to a different amount of financial leverage. Hence one can use costs of debt and equity which are observable in the market place to obtain the cost of equity or cost of capital of a similar firm with a different amount of financial leverage. The formula splits a given amount of business risk (asset beta) between lower risk debt and higher risk equity. The amount of risk borne by the equity, and consequently the cost of equity, depends on how much debt there is.

3.5   The idea of a split cost of capital is also used in the "divisional" cost of capital approach. If a firm has two parts A and B with different levels of risk then, in principle, the overall cost of capital of the firm may be split into different costs of capital for the two parts. The weighted average of these "divisional" costs of capital should be equal to the overall cost of capital of the business, where the weights are the relative contributions of the two divisions to the overall enterprise value:

WACC = Weight of A*Cost of capital A + Weight of B*Cost of capital B (4)

This approach is used when a firm has divisions in different industries.

3.6 The divisional cost of capital approach is commonly used to evaluate investments in different divisions using different discount rates. The divisional discount rate is applied to calculate the present value of the net cash flows from an investment, including associated revenues, costs, and capex. The idea is that the risk arising from an investment is affected by its industry more than by the particular firm which owns it. The cost of capital for the industry is commonly based on the observed costs of capital of firms operating exclusively in those industries.

3.7 A slightly different application of split discount rates is sometimes used to make an adjustment to the cost of capital for firms with different cost structures. Firms with high levels of fixed costs have high operating leverage, and *ceteris paribus* this should result in a higher asset beta. Using a very simple model gives the relationship between the beta of a firm's assets, the beta of its revenue stream, and its operating leverage measured by the amount of fixed costs (Brealey, Myers, and Allen (2011) p 250-251):

$$\text{Beta of asset} = \text{Beta of revenue} * [1 + \text{PV(Fixed costs)}/\text{PV(Asset)}] \qquad (5)$$

3.8 Equation (5) is a "fundamental beta" formula which assumes that fixed costs have zero beta and variable costs have the same beta as the revenue stream. While these are obviously stylized assumptions they give the useful insight that the asset beta of a firm is above the beta of its revenue stream, and that the difference depends on the level of fixed costs. This insight is sometimes used to make judgments about the relative asset betas of firms with different levels of operating leverage.

3.9 The purpose of the fundamental beta formula is to assist in estimating the asset beta for a company which does not have traded shares based on the observable asset betas of companies with traded shares. It makes the assumption that the main differences between asset betas of firms are caused by differences in revenue betas and operating leverage. It gives a transparent method, based on standard analysis, for adjusting risk estimates to allow for different operating characteristics of a business.

3.10 In summary, there is nothing wrong with the general idea of splitting a business into parts which have high and low risk to assist in estimating its cost of capital. The approach is commonly used. WACC and asset beta formulae combine information

about debt and equity contracts, which represent lower and higher risk claims on a firm. Releveraging formulae split a given asset beta between a high risk equity component and a lower risk debt component depending on the amount of financial leverage. The divisional cost of capital approach splits the risk of a firm into divisions of different levels of risk. The fundamental asset beta formula linking asset beta to revenue beta and operating leverage is based on the idea of splitting the risk of a firm between low risk fixed costs and higher risk revenue and variable cost streams.

3.11 All these methods are relatively standard. In each case the motivation is the same, to take the observable cost of capital of firms with traded shares and make various adjustments to get the cost of capital of an entity whose cost of capital is not observable. The issue is to use observable market data as effectively as possible to obtain the best estimate of the asset beta or cost of capital of the entity of interest. This issue arises mainly when a firm does not have traded shares, because in that case the firm's own asset beta cannot be observed directly.

3.12 The formulae share a common feature: they assume that the allocation of risk between two parts of a firm does not increase or decrease the overall risk. The split simply shares a given amount of risk disproportionately, with one part of the split firm receiving more risk per unit of capital and the other part receiving less. In contrast to all these formulae, Professor Helm appears to assume that simply splitting the risk between two parts of a regulated firm can change the overall amount of risk that the firm experiences.

Use of split discount rates in UK regulation

3.13 All the above formulae, which are based on split cost of capital analysis, have been used in UK regulation to assist in estimation of the cost of capital. The WACC, asset beta, and releveraging formulae (Equations (1), (2), and (3)) are commonly used as the workhorses of regulatory cost of capital analysis.

3.14 Equations (4) and (5) have also been used at times in UK regulation, to address particular issues where they were viewed as appropriate tools. As an example of the divisional cost of capital approach, Equation (4) was used in Ofcom (2005) and PwC (2005) to attempt to infer the cost of capital of BT's fixed-line business from its overall cost of capital. Another example is the company RWE, which owns UK

regulated businesses. It has disclosed its own divisional cost of capital analysis for those parts of its business (RWE (2001)).

3.15   Analysis based on operating leverage using a version of Equation (5) above was used in First Economics (2009) to make a judgment about the asset beta of NERL relative to airports (Table 4.4) and other utilities (Table 4.3). First Economics combined its judgment of operating leverage with information about the different revenue betas of various companies to infer the asset beta of NERL from the observable asset betas of other firms and industries. A similar approach was used in Oxera (2008) to assess the risk of Stansted Airport (e.g. Table 2.2).

3.16   Hence, analysis which depends on formulae derived from split cost of capital approaches is commonly used in UK regulation. Either it is used to take observable market costs of debt and equity and combine these to give the overall cost of capital, which is required to regulate the operations of the firm. Or it is used to make judgments about the asset beta of entities which do not have traded shares (such as NERL, Stansted Airport, and the fixed line business of BT) by inferring their asset betas from the asset betas of companies with traded shares using formulae which are ultimately derived from split cost of capital analysis.

Professor Helm's proposal

3.17   In contrast to the above approaches, Professor Helm's proposal involves taking a firm which is in a single business and splitting the cash flows from that business into two parts: the "RAB" and the ""non-RAB" parts of the business. The non-RAB part of the business carries all CAPEX and OPEX, while the RAB part of the business is guaranteed a return with a risk level that is commensurate with the cost of debt. The purpose is to recognise "the different risk characteristics of operating and carrying out investment (OPEX and CAPEX) on the one hand, and the regulatory asset base (RAB) on the other" (Helm (2011) page 1 point (2)).

3.18   This contention relies on the notion that the RAB can somehow be separated from the OPEX and CAPEX. I agree with the reasons given by the Competition Commission above that this would not be practical and does not make as much sense as the notional or actual splits of risk which underlie Equations (1)-(5) above. As the CC says, in practice the regulator has to regulate the overall regulated entity and the most

relevant cost of capital with which to do this is the overall estimated cost of capital of that entity.

3.19   One response by Professor Helm to this point is that "the potential loss to the investor [from a fall in the value of the RAB] is not the RAB, but rather the cost of rectifying failures to deliver the CAPEX and the OPEX and the associated outputs." (Helm (2011) page 18, my insertion in square brackets). This argument is an illustration of the risk transfer between the RAB and the non-RAB involved in Professor Helm's proposal. The way the RAB is made low risk is to <u>assume</u> that any relevant risk is borne by the non-RAB. That will shift risk from the RAB to the non-RAB, but not change the overall risk. So the response does not address the issue of why the overall level of risk will change.

3.20   Professor Helm's response also does not address a related issue. To the extent that the proposal is intended to operate by an actual separation of the RAB and non-RAB businesses it will change the boundaries of the firm. That will necessitate co-ordinating the amount and type of asset investment and operational management while these are in different organizations. This co-ordination will then have to take place via markets or contracts rather than internally within the firm. This raises the issue of whether the natural organizational boundary of an airport operator is between one entity which owns all assets and another entity which rents the assets and runs the business.

3.21   I am not an expert on industrial organization, but many influential experts (such as Joskow (1988)) suggest that such a split is not optimal for certain types of business. These are businesses where the assets have a highly specialized purpose, and decisions regarding investment in the assets must be co-ordinated in complex ways with decisions as to how they are operated. An airport seems to me to be a prime example of such a business. Professor Helm does not say why this is not a relevant consideration. If it is, then a split between the RAB and non-RAB parts of the business is unrealistic.

Difficulties of principle with the approach

3.22   As discussed above, there is nothing fundamentally wrong with split cost of capital approaches and they are commonly used. So if one assumes that the regulatory

contract will not change as a result of the split the issue is whether Professor Helm's particular version of the split cost of capital approach is likely to give a better estimate of the cost of capital of a regulated airport than more conventional approaches.

3.23   If Professor Helm's proposal is helpful, it should be equally valid when the regulated firm has traded shares from which one can directly infer its cost of capital. Therefore, to make the issue as concrete as possible, suppose that the firm being regulated has traded shares and its cost of capital and asset beta can be estimated in standard ways based on the observable risks and costs of its debt and equity. The asset beta will reflect the risk of its entire business, given the current structure of regulation. The regulatory purpose of allowing a rate of return which reflects this asset beta is to ensure that returns are commensurate with the current opportunity cost of capital.

3.24   As a simple illustration, consider a firm with 30% riskless debt (beta=0) and 70% equity with a beta of 1.0. Its asset beta will be 0.7, given by Equation (2) applied as follows:

$$0.7 = 0.3*0 + 0.7*1.0$$

3.25   Professor Helm's proposal consists of splitting this overall asset beta into two parts. One part is the "low risk" part related to the RAB and the other part is the "high risk" part related to OPEX and CAPEX. Using the standard divisional cost of capital formula, Equation (4) above, the following relationship between the asset betas of these two parts would hold:

Asset beta of firm = Weight(RAB)*Beta(RAB) + Weight(non-RAB)*Beta(non-RAB) (6)

The weights in the formula are the relative values of the two parts of the business.

3.26   Suppose that the firm with an asset beta of 0.7 has an RAB which accounts for 60% of its value. Suppose that the RAB part of the firm is deemed, by some method, to have an asset beta of 0.1. Then Equation (6) would imply that the beta of the non-RAB part would be the solution to:

Asset beta of firm = Weight(RAB)*Beta(RAB) + Weight(non-RAB)*Beta(non-RAB)

$$0.7 = 0.6*0.1 + 0.4*Beta(non-RAB)$$

The solution to this equation is that the beta of the non-RAB part would be 1.6.

3.27 It might appear that an asset beta of 1.6 is very high. However, the non-RAB business would be unlike any entity which is observable in reality. It would have all the risks and costs of the regulated business. In addition, since the low risk cash flow stream allocated to the RAB business would have to be paid out of the total revenue stream generated by the overall business, the non-RAB business would have the burden of delivering a near-riskless stream of cash flow to the RAB business. The non-RAB business would have a degree of operating leverage unlike any business which exists in reality, as far as I am aware. As a result, the non-RAB business would have a high asset beta. This is seen in the above calculation based on the divisional cost of capital formula (Equation (4)). The same result could be derived using the fundamental beta formula (Equation (5)).

3.28 A key point is that the overall asset beta and cost of capital of the business would not be affected by the calculation. The overall asset beta would still be 0.7, since risk is neither created nor destroyed by the calculation. The hypothetical split of a given amount of risk between two parts of a business neither creates nor destroys risk. This is a simple version of the Modigliani-Miller proposition that risk cannot be created or destroyed by reallocating it (Brealey et al (2011) Chapter 17).

3.29 In contrast, Professor Helm implicitly assumes that the asset beta would be altered as a result of his approach. Although he does not explicitly say so, his approach appears to apply the cost of equity of the firm to the non-RAB business: "Then apply the cost of debt to the RAB, and the cost of equity to the rest (or a mix of equity and debt to the non-RAB parts of the business)." (Helm (2011) page 17).

3.30 If this approach were adopted for the numerical example above, the asset beta of the non-RAB business would be 1.0 (the equity beta of the firm) rather than 1.6. The asset beta resulting from his calculation would be:

Asset beta of firm = Weight(RAB)*Beta(RAB) + Weight(non-RAB)*Beta(non-RAB)

0.46 = 0.6*0.1 + 0.4*1.0

3.31 Hence this interpretation of Professor Helm's approach would lower the estimated asset beta from 0.7 to 0.46. The reason it does this is that it attributes a beta of 1.0,

which reflects the degree of financial leverage in the equity of the firm, to the non-RAB business. This is too low. The non-RAB business would have a higher beta than the equity because of its high operating leverage. Thus Professor Helm's contention that using his split cost of capital approach would result in a lower estimate of the cost of capital results not from the split *per se*, but from implicitly assuming that there will be a change to the asset beta. In my opinion, this can come only from a material change to the regulatory contract.

3.32   As the above example illustrates, Professor Helm's approach appears to imply that the asset beta of a regulated business is below the estimate of its asset beta given by standard methods. In other words, the cost of capital of a firm is below the WACC given by standard methods. Note that this would be true in his approach <u>even if that WACC is directly observable from market data</u>. Hence the method appears to imply that market cost of capital estimates should not be used, even for regulated companies with traded shares.

3.33   If this approach were adopted it would have profound consequences for the regulatory contract. It would imply that regulated businesses would not be allowed to earn their WACC even when that WACC is directly observable. The result is a consequence of the assumption that the hypothetical non-RAB business would have a level of risk which is inconsistent with the operating leverage it would experience. In my opinion, the lack of any evidential support for this assumption is a major difficulty with the proposal.

3.34   Furthermore, there are other elements of Professor Helm's proposal which are not substantiated in detail. As the CC has noted, in reality the risk of the business is generated by a unified business which includes the revenue stream, assets, OPEX, and future CAPEX of the whole business. OPEX arises as a necessary consequence of operating the RAB assets. Similarly, CAPEX is an intrinsic part of operation of the entire business. Therefore, it is not clear why the RAB business should be allocated a very low risk and the non-RAB business a high level of risk. Since the cash flow paid to the RAB business is simply an internal transfer between it and the non-RAB business it would equally be possible to allocate risk proportionately so that they have equal asset betas. Professor Helm gives no empirical basis on which to make this judgment, an issue which I discuss further in Section 3 below.

3.35 In my opinion, the above example illustrates several key problems with Professor Helm's proposal:

- No method is proposed to estimate the cost of capital of the non-RAB business other than equating it to "…the cost of equity …. (or a mix of equity and debt ….)." (Helm (2011) page 17);

- No reason is given why the "cost of equity" should be used as the cost of capital for the non-RAB business, given the unusual nature of that hypothetical part of the business;

- If the cost of equity of the firm were used as the cost of capital of the non-RAB business, it would be inconsistent with the operating leverage of that part of the business;

- Standard analysis says that the hypothetical proposed split should not change the asset beta of the overall business;

- No reason is given why the proposed hypothetical split of the business should change the overall asset beta of the business;

- No reason is given why this method provides a better way of estimating the asset beta of the business than the standard approach which uses the observable costs and risks of debt and equity in standard ways and, if necessary, uses fundamental beta and leverage adjustments to adjust these for firms or divisions with no traded equity.

3.36 The proposal also fails to address important issues about the timing of returns. For instance, all assets in the RAB were once created by capex. Therefore, if capex is to be rewarded with a high rate of return, over what horizon does this high rate of return extend? The proposal implies that the differential rate of return will cease at the end of the regulatory cycle. That would appear to imply that capex which occurs early in the cycle will receive the higher rate of return for longer than capex which occurs late in the cycle.

3.37 Similarly, consider a firm which has invested at high rates in the past but not received the premium return on that investment which Professor Helm's approach implies.

Switching to the split cost of capital approach once the investment has been made will then deprive this firm of the fair return on that capital, since it will never have received the premium return on this investment.

3.38   The above criticisms apply if the purpose of the approach is to provide an improved way of estimating the cost of capital <u>given the current structure of regulation</u>. The overall WACC of a business is a weighted average of all its risks, so simply splitting these risks should not result in a different overall rate of return. If the asset beta does change as a result of the split, then it must do so as a result of a change in the regulatory contract, not from a simple splitting of the risks. If the proposal is intended to change the structure of regulation then it is possible (and even likely) that it could change the asset beta. However, in that case it would also change incentives and involve all the complex trade-offs which such a change involves.

Summary of theoretical issues

3.39   In summary, splitting the cost of capital is often used to obtain insights which assist in cost of capital estimation. The formulae which are used to implement this are relatively standard. They are the most practical and direct methods to attempt to infer the asset beta or cost of capital of regulated entities from observable capital market data such as costs of debt and equity or equity betas.

3.40   In my opinion, Professor Helm's proposal does not offer any obvious advantages over these conventional approaches. It is based on splitting the regulated firm into two parts, neither of which has equivalent firms with traded equity which are observable in practice. So there is no obvious basis on which to estimate the split costs of capital. Even if that could be done, there is no reason why it should affect the overall asset beta of the firm unless it changes the regulatory contract in material ways.

4.   ADDITIONAL PRACTICAL ISSUES THAT WOULD ARISE IF THE APPROACH WERE ADOPTED FOR BAA

Splitting the business

4.1   If Professor Helm's approach were adopted for BAA it would be necessary to split the business into the core "RAB" business and the "non-RAB" business. Although

Professor Helm asserts that the RAB business is virtually riskless, it is not, given that it is exposed to at least the following risks:

(a)   The risk that in future the market may prevent Heathrow charging to the full level of an RAB-based price cap;

(b)   Variances between actual and forecast passengers mean that Heathrow's return on the historic RAB will not equate to the regulatory return;

(c)   The political/regulatory risk of an RAB write-down.

4.2   Consequently, the RAB business requires equity to support it, so that the idea of 100% debt financing of the "RAB business" is incorrect. It would be necessary to estimate the overall asset beta and cost of capital of this part of the business and it could not be simply set equal to a cost of debt as Professor Helm asserts.

4.3   As discussed in Section 3 above, there is no observable company from which the cost of capital or asset beta of the non-RAB business could be estimated. Professor Helm's assertion that this could be set equal to the cost of equity of the overall firm is not correct.

4.4   In addition, as the CC observed, there is no practical basis on which a "low risk" RAB could be separated from the opex and capex needed to support the system.

Estimating the split costs of capital

4.5   To illustrate the difficulties in estimating the split costs of capital of the RAB and non-RAB businesses I will discuss an attempt to make an empirical split which is more standard, but along similar lines. This is to split a business between "assets-in-place" and future investment. This approach, which is often used as a conceptual device, has a structure similar to Professor Helm's proposed split but is different in the important sense that the assets-in-place includes the costs of operating those assets (OPEX for those assets). That is the standard way of treating a firm if one wishes to make this split (see e.g. Brealey et al (2011) page 116).

4.6   Splitting the cost of capital between assets-in-place and future investment has been attempted in the academic literature by Bernardo et al (2007) in the US. It has not, as far as I am aware, been adopted in practice by regulators or companies. The empirical

approach used by Bernardo et al involves many strong assumptions, and that is one reason for its lack of adoption in practice. However, their results illustrate some important issues regarding making such a split.

4.7   Table 1 presents their estimates of the average firm asset beta, beta of assets-in-place, and beta of future investment ("future growth") for US utilities and transportation companies for the period 1977-2004. These should not be taken as indicative of UK betas because of the different style of regulation in the UK. What is important is the estimates of the betas of assets-in-place and future growth relative to the overall asset beta.

4.8   For utilities the estimated beta of assets-in-place is 0.309, which is not far from the overall asset beta of 0.283. Contrary to what Professor Helm assumes, the beta of assets-in-place is not close to zero (even though US regulation tends to impose lower risks on utilities than UK regulation, see, for instance Alexander et al (1996)). Thus one important assumption of Professor Helm's approach does not seem to be consistent with the data.

4.9   For utilities, the beta of future growth is significantly higher than the overall asset beta. There is no evidence for the contention that future investment has a risk equal to the risk of the equity of these companies.

Table 1: Asset betas for assets in place and future growth estimated by Bernardo et al

	Estimated asset beta, average 1977-2004		
	Overall asset beta	**Assets-in-place**	**Future growth**
Utilities	0.283	0.309	0.583
Transportation	0.695	0.573	1.290

Source: Bernardo et al (2007) Tables I and II

4.10   For transportation the pattern is similar. The beta of assets-in-place is somewhat lower than the overall asset beta, and the beta of future growth is much higher. The beta of future investment has a very high beta of 1.29, even though it is less risky than it would be with Professor Helm's proposed split. In the Bernardo et al split it does not have the burden of paying a fixed return to the assets-in-place plus the operating costs of those assets, both of which would increase the operating leverage of this part of the business under Professor Helm's split.

4.11   The split made by Bernardo et al does not affect the overall asset beta of these firms. They assume that this is unaffected by the split. Indeed, they use Equation (6) above as the basis of their estimation procedure. For any individual firm in their sample, the value-weighted average of the two betas is equal to the overall asset beta. (The industry averages they report do not satisfy this relationship because of the averaging procedures they use.) Hence their procedure would, if adopted as an approach to implement Professor Helm's proposal, not change the estimated asset beta of the overall firm being regulated. In that sense, it would not assist at all in estimating the cost of capital of BAA.

4.12   In my opinion, this study illustrates several important points about Professor Helm's proposed split cost of capital.

4.13   First, it is extremely hard in practice to find a sound empirical basis on which to split the cost of capital between assets-in-place and future investments. Even though Bernardo et al use a more standard split than Professor Helm (because they include the operating costs of existing assets in their risk), their results depend on very strong assumptions, vary over time, and have not as far as I am aware been adopted in practice. In my opinion such a split is not helpful.

4.14   Second, if such an approach is adopted the beta of assets-in-place is not close to zero as Professor Helm assumes. The reason for this is simple. Most of the value of a normal firm comes from its assets-in-place. Therefore, when you measure its asset beta most of what you are measuring is the beta of the assets-in-place. So there is generally little reason to attribute to those assets a level of risk or a cost of capital very different to the overall asset beta or cost of capital of the firm.

4.15   Third, if one uses the Bernardo et al approach to make an empirical split of the cost of capital its main implication is that future investments are significantly more risky than both assets-in-place and the overall asset beta of the firm. Hence if the cost of capital had to be adjusted for anything it should be to raise the cost of capital for future investments relative to the estimated asset beta of the firm.

4.16   Fourth, if the approach is used in the standard way, it delivers back an overall asset beta which is the same as the asset beta you start from. Splitting the cost of capital of the firm does not change the firm's overall asset beta, as Professor Helm suggests.

4.17   In summary, attempts to empirically estimate a split of the cost of capital somewhat similar to Professor Helm's proposal have been made, with the important difference that on-going OPEX is considered an intrinsic part of the assets-in-place of the firm. The approach has not, as far as I am aware, been adopted in practice by either firms or regulators. These attempts illustrate the difficulties of implementing such an approach and the fact that the outcome of it is different to the assertions about its likely outcome made by Professor Helm.

5.   CONCLUSIONS

5.1   Professor Helm's paper raises two important issues: (1) What will happen to the cost of capital under the split cost of capital approach if there is no change to the regulatory contract? and (2) Will the cost of capital change if the regulatory contract changes as part of the implementation of the split cost of capital approach?

5.2   In this report I have considered issue (1) and I conclude on balance that Professor Helm's particular proposal does not offer additional assistance in estimating the cost of capital of an airport or represent the best approach for a regulator to take, given the various methods that are already available. If there is no change in the regulatory contract, Professor Helm's split cost of capital approach should not change the cost of capital. If the regulatory contract does not change the overall amount of risk to be borne by the airport operator does not change. Simply splitting a given amount of risk does not change the overall amount of risk. The overall cost of capital depends on the overall amount of risk and, therefore, the cost of capital should not be changed by the approach.

5.3 While the idea of splitting the cost of capital between low and high risk parts of a business can be helpful, it is already used in a number of standard ways in UK regulation. However, Professor Helm's particular way of splitting the cost of capital is not standard. It involves a hypothetical split which is unrealistic, in the sense, noted by the Competition Commission, that it separates operating expenditure and on-going capital expenditure from the assets with which they are intrinsically connected in the running of the business and the regulatory framework.

5.4 Furthermore, Professor Helm suggests particular values for the costs of capital of the "RAB business" and "non-RAB business" that are not supported by empirical evidence. Also, adopting Professor Helm's proposal for these would imply that the hypothetical split changes the overall asset beta of the firm, even though it does not change the fundamental risk of the business. This is inconsistent with standard finance theory and inconsistent with regulation delivering a return commensurate with the cost of capital of regulated firms with traded equity.

5.5 The approach is also inconsistent with the empirical literature which attempts a split along lines related to Professor Helm's proposal. This approach splits the business into assets-in-place (including the associated operating expenditure) and future investments. The empirical results are inconsistent with Professor Helm's proposal. Also, as far as I am aware, because of the difficulties in implementation the approach has not been adopted in practice by any firm or regulator of which I am aware.

5.6 The above considerations apply if the proposed method is to be used to assist in the estimation of the cost of capital given the current regulatory contract. If the proposal is intended to change the regulatory contract its evaluation should involve considerations of the trade-off between incentives and risk-sharing which are not covered in detail in Professor Helm's report and are not discussed in this report.

5.7 To reduce the cost of capital in the way Professor Helm suggests, the changes to the regulatory contract which accompany the split cost of capital approach would have to materially reduce (or eliminate) risk to the RAB without affecting other risks. In that case, the change in the cost of capital would come not from the split cost of capital approach itself, but from the change in the regulatory contract.

5.8   For instance, if the Government were to give a perpetual guarantee of the value of the RAB (as implied in Helm (2011) page 12) it could materially reduce the risk to the airport operator by transferring risk to the Government. The split cost of capital approach would then be one way of estimating the effect of this risk transfer on the cost of capital of the airport operator. However, the most direct way to do this would be to evaluate the risk transfer from the company to the Government and adjust the cost of capital directly for this, which would not require the split cost of capital approach. Also, this risk transfer would change the incentives of the operator. A correct evaluation of the overall effect of the changed regulatory contract would then depend on the balance of effects of the risk transfer on the cost of capital, the cost of the Government guarantee, and incentives.

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