Economic Regulation and Capital Expenditure

- Consultation Paper -

January 2001

Civil Aviation Authority
CAA House, 45-59 Kingsway, London WC2B 6TE
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Executive Summary

Recent feedback to the CAA from both airport users and operators has identified capital investment as a key issue in the forthcoming quinquennial review. In an environment of continuing future growth in traffic, the capacity constraints currently experienced at designated airports in the South-east of England mean that for BAA in particular, an environment that incentivises appropriate future capital expenditure (capex) is crucial.

Capital spend at the designated airports in the South-east for the current quinquennium is expected to be approximately £2.86 billion (over six years) while Manchester Airport projected spend is £287 million\(^1\) (over five years). It has been suggested that the current regulatory framework may not provide efficient incentives for investment. The CAA believes that despite clear statutory objectives the incentive regime for capex resulting from the standard regulatory framework is unclear, and potentially provides incentives for over, under and inappropriate investment. The public planning process is an important consideration for investment projects, perhaps more so than other industries.

This paper examines these issues with a view to forming an opinion of whether the current regulatory framework provides designated airports with the best possible incentives to make economically efficient investment decisions, or whether there should be a change in the regulatory approach. Proposals for the regulator to carry out a detailed capex review and monitoring process to attempt to compensate for the distortions mentioned above are not currently considered appropriate. There may be a role for increased involvement of better informed user groups, and the CAA wishes to further explore the potential for increased user consultation based on capex plans as part of comprehensive forward-looking business plans more generally.

A key emphasis of this paper is the importance of airport consultation on capex, and making available information to airlines to allow users (and the regulator) to understand the options available and the trade-offs to be made between them. Greater user involvement could be formalised through a contractual approach, in which users negotiate directly with the airport over capital projects. This could allow additional outputs related to future capex to be handled outside the price cap and be replaced by contracts between airports and users. This would be consistent with the default price cap approach to setting charges. However, the resulting incentive structure of this approach raises a number of issues, including the robustness of the price cap.

Comment is invited on whether the current regulatory framework provides suitable incentives for adequate and appropriate capital spend and also whether the proposed

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\(^1\) Nominal figures, i.e. not in present value terms.
approaches to the capex issue and CAA’s initial assessment of the associated trade-offs from the different approaches appear reasonable.

A summary list of questions posed in the text are:

- How might the level of revenue advancement associated with T5 be addressed in the forthcoming review process?
- How accessible are capital plans circulated by airports and how useful are they as consultation devices? How desirable is enhanced disclosure?
- Are the current incentives for investment and the resulting actual investment, or projected investment, adequate and appropriate, or are better regimes available or desirable?
- Is a capital expenditure review appropriate and what might its objectives be?
- How could, or should, the role of users be enhanced in informing the development of capital expenditure planning and monitoring?
- Which facilities might be candidates for contracts outside of a default price cap?
- How might the frameworks laid out in this paper compare to these alternatives presented in other CAA consultation papers, and where are these ‘alternatives’ complementary?
- To what extent is the planning regime a binding constraint? How does this differ between different developments?
- How can the regulatory framework best incentivise appropriate investment given planning constraints?
- How should the RAB be rolled forward?
- On what basis should new investment be added to the RAB?
- How should AICC be treated?
Responses

Comments on the issues raised in this paper and any other issues which respondents believe should be considered by the CAA in reviewing the airports should be sent in writing by **22 March 2001** to:

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All responses will be treated as public information unless otherwise specified. If a response is made in confidence it should indicate that.
1. Introduction

1.1 How the regulatory framework acts to secure sufficient and appropriate capital investment is a key issue. One of the CAA’s statutory objectives is “To encourage investment in new facilities at airports in time to satisfy anticipated demand by the users of such airports.” The incentives for efficient and appropriate investment provided by the current regulatory framework are not clear, and these are further complicated by the influence of the planning process. Furthermore, current and anticipated utilisation of capacity at different designated airports varies, and the issues for capital expenditure problem are not uniform. While Manchester Airport has just finished a major capital investment with the completion of a second runway, Gatwick and Heathrow airports have capacity constraints throughout the whole day.

1.2 The relative importance of these influences and their practical effect on the level and appropriateness of capital expenditure is not immediately obvious. This paper is intended to form the basis for consulting interested parties on whether there are or will be significant shortcomings in the investment programme and where in principle the incentives under the current framework appear weak or uncertain. In addition, the paper will outline possible solutions to such shortcomings in the current regulatory framework.

1.3 The paper is structured as follows:

- Section Two outlines the capital expenditure by airports during the current review period and outlines future spending plans. The transparency of plans to deliver existing and new outputs in the future is also addressed.

- Section Three introduces the current regulatory framework and the regulatory problems posed, before considering the following approaches:

  - regulatory capex review;
  - increased information disclosure and user consultation;
  - default price cap;
  - other work strands currently being considered by the CAA including revenues linked to new outputs.

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2 Airports Act Section 39
• Section Four considers the role of external influences on investment incentives, most notably the planning regime and its interaction with economic regulation.

• Section Five provides conclusions.

• Annex One outlines the principles underlying the traditional regulatory model.

• Annex Two details the investment incentives under the traditional model.
2. Background

Demand and capacity at the designated airports

2.1 A critical issue facing UK aviation is the amount of capacity available at airports in the South-east. Capacity constraints can apply in a range of areas, the most high profile being runway capacity (which may restrict movements), terminal capacity and aircraft stand availability (which may restrict movements and passenger numbers). Capacity is, in one sense, a proxy for well-defined outputs that an airport can or does produce. However, defining and estimating a measure of capacity is not always straightforward. Often there are trade-offs that can be made; for example more passengers can be accommodated in a terminal which allows less space per passenger. Therefore, estimates of increases in terminal capacity from additional capex (as seen for example in BAA capex plans) assume a certain quality of service that is dependent on space allocation per passenger. However, by changing this assumption increases in capacity can be changed, for example service quality could be increased at the expense of capacity. The starkest constraints apply to runway capacity, where there are absolute limits on the number of movements on a particular runway (or combination of runways).

2.2 If there were an efficient and liquid market in slots at congested airports, the market prices of access to the scarce capacity could be easily observed, and would provide a good estimate of users marginal valuation of additional capacity. However, such a market does not yet exist, and reliable data is not readily available.

2.3 Looking at current capacity usage provides strong evidence that, at current levels of airport charges, additional capacity is in heavy demand at Heathrow and Gatwick. Demand for access to air transport facilities typically has defined peaks, since demands to travel at particular times of day, on particular days, or in particular seasons will vary considerably. If capacity is generally fully utilised, and does not display peaks in usage, this is a strong indication that demand for access to the airport at prevailing charges is being stifled by capacity constraints. This is not to say that additional capacity is necessarily desirable (there may be environmental factors which are not taken into account by users of aviation services, but which are attempted to be internalised by the planning process), but simply that there is evidence that demand for additional capacity clearly exists (subject to the costs of providing it).

2.4 Figure 1 below shows the declared hourly scheduling capacities at each of the designated airports, together with the slots allocated by the Airports Co-ordination Ltd Co-ordinator, for the summer and winter periods. At Heathrow and Gatwick, although there is limited variations in passenger flow through the airport both during the day and, in the case of Gatwick, during the year, the
airports are sufficiently congested throughout the day to suggest that the ‘peak’ now runs from early morning to early evening (the dips at midday provide a ‘firebreak’ to allow the system to catch up with any problems earlier in the day). This is true for both summer and winter. This provides a strong indication that both airports face considerable excess demand at prevailing access prices, and that additional capacity would be valued by users and passengers.

2.5 There is not the same evidence for Manchester or Stansted. The figure shown for Manchester does not include the additional capacity to be provided by the second runway there, and even with a single runway the runway displays a more normal peak-trough pattern, with the upper limit of runway capacity being hit only in the peaks.

Figure 1: Declared hourly scheduling capacities at designated airports

**Heathrow**

![Heathrow Graph](image)

**Gatwick**

![Gatwick Graph](image)
2.6 Figure 1 above illustrates the situation prevailing in 2000-2001. Demand for access to the designated airports is projected to continue to increase in the future, which will put heavier pressure on existing capacity, and will increase the demand for additional capacity. Along with user demands in relation to service quality standards this serves to highlight the critical importance of capital expenditure for the industry.

**Historical capital spend**

**BAA**

2.7 BAA has set out its latest capex forecasts in its 10 year Capital Investment Plan (CIP)\(^4\). According to this, BAA invested £316 million at their South-east airports in the year ending March 2000. By 2010/11, this annual figure is expected to rise to around £600 million in real terms as BAA envisages total investment over the next 10 years of £6.4 billion, with Terminal 5 (T5) being a major influence under current plans\(^5\).

2.8 During the current review period there is a significant difference between BAA’s total forecast and actual spend, over the two quinquennia as shown in the table below.

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3 Recognising that some users may prefer lower service quality standards (at lower prices).

4 BAA, BAA London Airports 10 Year Capital Investment Programme, proposals for consultation, October 2000

5 Nominal figures, i.e. not in present value terms.
Table 1: High level comparison of BAA capital expenditure with that planned in 1996 (MMC4) in the period 1997/98-2006/07 (£ millions in 2000/01 prices)

<table>
<thead>
<tr>
<th></th>
<th>1997/98-2002/03 (6-years) Total</th>
<th>2003/04-2006/07 (4-years) Total</th>
<th>10 Year Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MMC 4</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HAL</td>
<td>2,717</td>
<td>1,534</td>
<td>4,251</td>
</tr>
<tr>
<td>GAL</td>
<td>386</td>
<td>232</td>
<td>618</td>
</tr>
<tr>
<td>STAL</td>
<td>157</td>
<td>323</td>
<td>480</td>
</tr>
<tr>
<td>BAA London Airports</td>
<td>3,260</td>
<td>2,090</td>
<td>5,349</td>
</tr>
<tr>
<td><strong>Actuals &amp; 2000 CIP</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>HAL</td>
<td>1,993</td>
<td>2,714</td>
<td>4,708</td>
</tr>
<tr>
<td>GAL</td>
<td>537</td>
<td>428</td>
<td>965</td>
</tr>
<tr>
<td>STAL</td>
<td>436</td>
<td>151</td>
<td>587</td>
</tr>
<tr>
<td>BAA London Airports</td>
<td>2,967</td>
<td>3,293</td>
<td>6,260</td>
</tr>
<tr>
<td><strong>Difference from MMC plan (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAA London Airports</td>
<td>-9%</td>
<td>58%</td>
<td>17%</td>
</tr>
<tr>
<td><strong>Difference from MMC plan in NPV terms (%)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BAA London Airports</td>
<td>-12.5%</td>
<td>58%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Notes:
MMC report figures are uplifted to 2000/01 prices, using the RPI and C OPI (construction price) indices.
A dual expenditure data to 1999/2000 from BAA 10-year capital plan (including centralised capital costs).
Forecasts from 10 year CIP, and assume no increase in real construction costs.

2.9 The principle difference in the forecasts assumed in MMC4 and the currently expected figures for Q3 and Q4 reflects the delay in T5 spending. At the 1996 price cap review, BAA was forecast to spend £3.26 billion in the period 1997/98 to 2002/03 (at 2000/01 prices) of which over £1.5 billion was made up of T5 and related projects. In contrast, the 2000/01 CIP projects that BAA’s total spend over the same period will be £2.97 billion of which only approximately £0.5 billion will be T5 related. Therefore, within the programme there has been a considerable increase in actual and projected non-T5 spending at Heathrow, in part to compensate for the T5 delay, with a corresponding increase in the spending at Heathrow in the next quinquennium compared to that envisaged at the last review. There is also an increase in forecast spending at Stansted and Gatwick over the current quinquennium compared to that envisaged at the last review.
2.10 Looking at 2003-2007, current expected spend in Q4 is higher than that envisaged at the time of MMC4, which is primarily due to the delay in spend on T5. Over the whole 10 year period, overall spend is approximately £0.9 billion more than originally forecast at MMC 4 (an undiscounted increase of 17%). This is partly due to increases in the expected cost of T5 and to the additional costs of compensating for the delay in T5. In present value terms the overall spend is still higher than forecast at MMC4, but the difference is smaller at only 9% of the total.

Advancement of revenue

2.11 The delay in the construction of T5 has meant that BAA has not incurred the same level of capital expenditure as envisaged in the price cap formula, despite increased spending elsewhere at Heathrow in part to offset the delay in T5 construction. This shortfall in spending has not been primarily due to efficiency gains made by BAA, but is the consequence of the prolonged T5 planning enquiry. Therefore, if BAA has priced up to the level of the cap over the last five years, they will have received a rate of return on capital above that envisaged in the price cap formula (all other factors remaining equal). The problem was set out in the last MMC report for Manchester Airport:

“Failure to invest the sums allowed for in a price review lowers the asset base at the time of the next price review but in the interim allows additional revenue in terms of rate of return and depreciation on the amount not spent, assuming that the airport has priced up to the cap.”

2.12 This problem has been exacerbated by an allowance in the price cap formula that was intended to smooth the level of charges at Heathrow over the time that T5 was being built. However, with the delay in construction, this revenue advancement increases the additional revenue that the airport could receive without the expected investment.

2.13 In responses to the CAA’s July Issues Paper, a number of users and representative bodies (BARUK, British Airways and Britannia) all argued that pre-funding of capital investment projects should not be permitted.

2.14 If T5 goes ahead then one option would be to take into account the capex shortfall and advancement of revenue, plus interest when calculating funding for the project in the price formula at the next review (taking into account the level of additional spend elsewhere to compensate for the delay in T5 construction).

2.15 If T5 were not to go ahead the capex shortfall and advancement of revenue would represent a significant under-spend on capex. In this case the CAA has a

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6 Calculated using 7.5% discount rate.

number of options. One approach would be to ‘claw-back’ the advancement and shortfall, by including this in estimations of the price formula at the next review. Clawbacks of capex underspend can, however, produce undesirable incentives for making efficiencies in investment plans. Even in this case, where the capex shortfall is itself relatively easy to determine, there have been increases in other spending to compensate. Taking these into account would require an \textit{ex post} review by the regulator that could be taken as a signal that similar reviews would occur in the future. This may affect future investment incentives, especially those projects of a comparable size. Calculating the actual level of advancement and shortfall will be important in determining what action should be taken.

The CAA invites comment and reasoning on how the level of receive advancement might be addressed in the forthcoming review process.

Manchester

2.16 A comparison of actual and forecast capital expenditure figures at Manchester airport show investment for the current review period is expected to be approximately £50 million above forecasts at the last review. This is shown in Table 2 below. Initial under-spend in 1998/99 was because of delays in starting the major contract for the second runway, while slippage in subsequent years with surpluses of actual spend against forecast spend is planned, in part as a consequence.

Table 2: Comparison of actual and forecast capital expenditure at Manchester Airport (£ millions in 2000/01 prices)

<table>
<thead>
<tr>
<th></th>
<th>1998/99</th>
<th>1999/00</th>
<th>2000/01</th>
<th>2001/02</th>
<th>2002/03</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>MMC forecast</td>
<td>98.9</td>
<td>60.0</td>
<td>35.5</td>
<td>67.8</td>
<td>78.0</td>
<td>340.2</td>
</tr>
<tr>
<td>Actuals &amp; 2000 capital plans</td>
<td>88.0</td>
<td>69.7</td>
<td>62.2</td>
<td>95.4</td>
<td>74.9</td>
<td>390.3</td>
</tr>
<tr>
<td>Difference</td>
<td>(10.9)</td>
<td>9.7</td>
<td>26.8</td>
<td>27.6</td>
<td>(3.1)</td>
<td>50.1</td>
</tr>
</tbody>
</table>

Notes
MMC figures uplifted to 2000/01 prices using the RPI and COPI (construction price) indices.
2000/01 estimate from budget
2001/02 and 2002/03 estimates from Manchester Airport’s 15 year plan

Major future capital projects

BAA

2.17 From BAA’s 2000 CIP, the largest single project at London airports over the next 10 years will be T5, with development costs up to 2010/11 estimated at £2.6 billion, of which approximately £2 billion is construction costs. This is intended
to provide a new terminal complex with an annual capacity of about 30 million passengers. Apart from T5, investment over the next 10 years at Heathrow will be approximately £2 billion. Within this, major projects are the development of current facilities to cope with the increase in demand before T5 is opened, and developing the airport in anticipation of an expected DETR direction to segregate arriving and departing passengers within terminal facilities. Significant capex items include £600m to be invested in customer service and quality enhancements, including developments of terminal one long-haul operations to meet the demands of larger aircraft, and the central terminal area development strategy. Additionally, £180 million is to be invested on runways and developing the apron areas, primarily to facilitate the accommodation of larger aircraft, and approximately £137 million is to be invested in pier service and segregation. The CAA expects considerable investment to be planned for the replacement of existing assets.

2.18 Future capex at Gatwick will depend on which of the two current development concepts for the airport that BAA will choose. The figures in the capex plan are based on implementing development plan Concept 1a as set out in Gatwick’s Sustainable Development Strategy, adding satellite terminals to the existing north terminal. A final decision on the development plan is not expected until 2001. Within the £976 million estimated spend at Gatwick, the most significant items are intended to enhance both capacity and quality of service, through the provision of new piers at the north terminal, new infrastructure and stands throughout the airfield and the development of the north terminal’s baggage system.

2.19 At Stansted the key investment projects in the next three years are focused on bringing the capacity of the airport up to 15mppa. The largest projects within this expansion are the extension of the terminal, a third satellite facility (both of which are expected to be completed in 2002/03) and the development of the taxiway to act as a stand-by runway. Another large investment in the short term is the development of the cargo facilities. Over the 11-year period to 2010/11 the most significant expenditure is on developments to extend the airport after a traffic level of 15mppa has been reached. This development includes terminal enhancements, satellites and track transit systems. These works are expected to have begun by the end of Q3.
Manchester

2.20 Manchester Airport plc is at present in the process of undertaking a substantial revision of its capital expenditure programme, and extending it to 2015. The current programme is indicative only. The largest capital expenditure items currently planned over the next three years are on a mixture of projects. This includes improving access to the airport through investment in a ground transport interchange, jointly funded with Railtrack and the local Passenger Transport Executive (Manchester’s share is around £50 million plus a contribution towards the cost of extending the Metrolink system to the airport). Final expenditure on the second runway (R2), and associated projects will be in the region of £30 million before 2004/05. Other significant items in the short-term capex programme are likely to include smaller scale schemes in all three terminals to increase capacity through removing bottlenecks and increasing baggage system capacity (examples are providing additional check in desks in terminal one and a bus lounge in terminal two).

2.21 In the longer term, Manchester’s main areas of spend in their 15 year investment plan are on terminal expansion, especially in terminals one and two with spend over the period in the region of £200 million and £250 million respectively, and phase two developments of R2, including improvements to the taxiway systems. Within a total 15-year spend envisaged at £1.23 billion, approximately £60 million is estimated for dedicated retail developments.

Transparency of planning

2.22 BAA began publishing its 10 year investment programme in 1996 following the MMC’s conclusion at the last review that “consultation with the airlines on the capital programme is essential to enable the costs and benefits both of overall strategy and individual projects to be evaluated adequately.” This document is published annually and the most recent CIP, published in October 2000, is presented as a focus for consultation between interested parties. To this end the 2000 paper makes a number of important advancements compared to previous papers, that help to increase transparency in the programme. The most important of these is the comparison of the 1999 and 2000 investment programmes with figures for project commencement and completion dates and actual spend to date on projects that facilitates following the progress of individual projects. This is in response to airline feedback.

2.23 Capital expenditure plans are not circulated in as much detail at Manchester Airport. Most recently the airport has circulated a one page summary of estimated capital investment plans for the next 15-years. However, MA is

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8 MMC, BA A Plc, A report on the economic regulation of the London airports companies, June 1996, para 2.64
planning to provide a document providing more information on the expenditure figures provided.

2.24 As users are interested in the planned development of the total airport business, including demand projections, development of existing assets as well as investment in new facilities, opex versus capex trade-offs, contingency planning and service quality reconciled with resourcing plans and implications for charging, possibly the disclosed capex plans should evolve into full business plans for the regulated businesses.

The CAA invites comments from users as to the accessibility of these documents and their use as consultation devices and the desirability of enhanced disclosure.
3. **Regulatory framework**

3.1 Currently, UK designated airports operate under a price cap mechanism\(^9\) whereby a ceiling to charges is set at fixed intervals. At the heart of this framework is the view that information asymmetries inherent in any regulatory regime preclude the imposition of ‘correct’ solutions on the regulated firm by the regulator. Therefore emphasis should be on regulation more by incentives, including those aiming to induce the optimal level of effort by the regulated firm. However, a number of problems have been identified with this approach.

3.2 A number of consultation responses from both airlines and the airports have remarked that in practice the current regime may not provide adequate incentives for investment. Inadequate incentives for firms to invest appropriately will result in economic inefficiencies, as the full costs and benefits of investment will not be considered, and therefore total net benefits in the long term will not be maximised. In principle the standard RPI-X system provides a number of incentives for the firm to both over and under invest at different stages in the investment process compared to both the (unattainable) competitive position and the unregulated monopoly alternative\(^10\). These different incentives as well as potential solutions within the traditional regulatory framework are analysed in detail in Annex 2. These invite consideration of a number of questions addressing the consequences for investment incentives of using different approaches to calculating elements of the regulatory price cap, including the calculation of the regulatory asset base (RAB) and assets in the course of construction.

3.3 The problem facing the regulator is therefore to ascertain whether in practice the investment incentives resulting from the current regulatory framework result in a significant distortion in the level, type and timing of capital investment compared to a structure that maximises benefits to society.

3.4 If the regulator were convinced that there was evidence of a significant divergence from economic efficiency then the regulatory approach to capital

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\(^9\) The price cap framework is briefly outlined in Annex 1

\(^10\) Under the (unobtainable) scenario of perfect competition, multiple firms will invest up to the point that price equals the firm’s marginal costs and no super-normal profits are achieved. If a firm in the market is making a super-normal profit, firms will enter the market and invest up to the point where no firm is making super-normal profit (except where this reflects superior efficiency on the part of a particular firm). Conversely, the unregulated monopoly will invest to the point where the firm’s expected marginal cost equals expected marginal revenue, and price above the competitive level. This will involve a lower level of investment than would occur in a competitive market as the monopoly pricing level is obtained by restricting supply and obtaining resultant scarcity rents. Additionally, the monopolist does not face the threat of new investment by market entrants. This would mean that some projects that society valued above their costs would not be undertaken, and therefore benefits would be forgone. The differences in cost between the two extremes depend, in theory, on demand elasticities and cost effectiveness.
investment issues should be reconsidered. In this case the regulator has two broad options:

- regulation could continue to utilise the current incentive based structure with current incentives altered through the utilisation of different approaches to calculating elements of the price cap;
- a more control based form of incentivising capital expenditure could be applied.

3.5 Different approaches to calculating elements of the price cap could be, for example, through the separation of estimated costs for the cap from the firm’s cost base, different approaches to calculation of the RAB, or verifying the processes whereby the firm properly assesses the business case for projects or linking prices to outputs (including service quality). These are dealt with in more detail later in this paper, in Annex 2 and in separately published consultation papers.

3.6 A number of consultation responses suggested that in line with option (b), when setting the price formula, it would be appropriate for the CAA to conduct a capex review ‘ex ante’ and/or monitor the firm’s implementation of the capex plan. This is addressed below.

The CAA seeks views and evidence on whether current incentives for investment and the resulting actual investment, or projected investment, are adequate and appropriate, or whether better regimes are available or desirable.

Capex review

3.7 A full capex review and continual monitoring of the firm’s capital investment by the CAA could be structured so that capital expenditure planning including project development and decision-making processes would be reviewed and individual projects could be sampled. Ultimately the regulator would become involved, in effect, in approving or disapproving elements of the plans according to its view of whether they were worthwhile. This process would involve much greater regulatory investigation into the regulated firms and may signal a more intrusive type of regulation than currently applied. It would substantially dilute the accountability of the airport for the investments planned and undertaken. This may be inconsistent with the CAA’s preferred incentives based approach to regulation outlined in the October Position Paper\(^ {11}\). In effect, a full capex review would be recognition that the current regulatory regime does not provide adequate incentives to ensure capex of the appropriate level or type and greater regulatory oversight is necessary.

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\(^{11}\) CAA, The CAA Approach to Economic Regulation and Work Programme and the Airport Reviews, October 2000
3.8 Some other regulators have used capex reviews. In its most recent price review, Ofwat was involved in a detailed investigation into regulated water companies' capex plans. Within the review Ofwat compared cost efficiency of different companies, by setting all companies a number of hypothetical capital projects to cost. Ofwat also carried out a detailed review of individual capital projects within proposed capex programmes through 'reporters' contracted to each company. Ofwat is also involved in monitoring the outputs of the company on an ongoing basis.

3.9 The primary motivation behind this approach is to determine a level of capital expenditure appropriate to provide a certain set of outputs. The pricing formulas for the regulated water companies are then set on the basis of achieving the specified set of outputs. In response to perceived problems the ORR and Ofgem have also applied a more activist approach to addressing capital expenditure issues.

3.10 However, this regulatory framework works best where the regulator can determine an appropriate set of outputs with the regulated firm, which can then be expressed quantitatively and monitored in the future. While the CAA is strongly in favour of appropriate pricing of outputs, and different dimensions of outputs, this may be difficult in the airport industry which has a heterogeneous output set and multiple users, who are unlikely to value outputs consistently. Such an approach would require the regulator to “second-guess” management decisions at periodic review points with less information and responsibility than the airport management, increasing regulatory risk and possibly removing incentives for the regulated business to optimise projects included in the regulatory capital programme. Therefore, at this stage the CAA believes that a comprehensive capex review has the potential to be an expensive, time consuming and ultimately unproductive undertaking.

3.11 Continual monitoring of capital expenditure by the regulator during the inter-review period is not expected to be the most efficient or effective solution, for principally the same reasons. Additionally, imposing a formal monitoring structure on the airports may reduce their flexibility to adjust capex to react to new information on technology, costs, and user demand.

3.12 Capex monitoring has been introduced elsewhere following significant difficulties when analysing historical and projected levels of capital expenditure, and significant differences between planned and actual expenditures at previous price reviews that cannot be clearly explained (with actual spend below forecasts). Previous price reviews at airports have not experienced such levels of difficulties, and the expected shortfall for BAA capital expenditure at this review is likely to be largely explained by the delay on T5. In the case of BAA, the MMC came to

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12 For more discussion of this, see CAA, Quality of Service Issues, December 2000 (available at www.caaerg.co.uk).
the conclusion at the last review that although the mix of their investment programme over Q2 had been different from that forecast, the overall level of investment was broadly consistent with that on which the financial projections were based. At Manchester, although capital investment over Q2 was lower than forecast at the previous review, the CAA did not make an adjustment for under-spend as the airport also under-recovered revenues adequately over the period to compensate for the investment shortfall.

The CAA invites views, arguments and evidence on whether a capital expenditure review is appropriate and what its objectives might be.

Information disclosure and consultation with users

3.13 An important difference between airports and some of those industries where comprehensive reviews of capital expenditure have been carried out is the difference in user structure. UK utilities have traditionally supplied a large number of individual and uncoordinated consumers. Airports have a much stronger direct user group in the airlines, which are well-informed and co-ordinated through trade associations, user groups and, potentially, alliances.

3.14 Airline user groups currently play a significant informal role in consultation with airports on agreeing capex plans, with wide-ranging consultation through a number of different forums. Users have also demonstrated that they can offer joint responses to airport capex plans through user groups, as in the LACC’s current co-ordination of a response to BAA’s latest Capital Investment Programme.

3.15 An alternative to a capex review or monitoring by the regulator could be an increased role for informed consultation with users, through inclusion of a user group in a capex review and monitoring process. This would build on the current level of consultation between users and operators by providing users with a more defined role, follow the recommendations of the last review by increasing the role of consultation, and be in line with the CAA’s stated intention of reducing the regulatory burden where possible. For this to be effective the capex plans provided to users should be transparent enough for users to understand the connection to business objectives and problems, available options, key trade-offs that are associated with projects and the costs, benefits and risks involved. The basis for the provision of information would be that the same level of information would be provided as if there was a cost plus contract between the airport and users. This would mean that the airports should disclose forward looking business plans covering demand projections, capex and opex plans, and the potential substitutability of capex and opex to meet those projections, risk management studies and policies and projected charging policies, consistent with those plans. Over time these plans should be reconciled with the previous plans such that changes and their motivation can be clearly understood.
3.16 The role of the user group would then be to review capex plans with the airport with the latter being willing to listen with an open mind to points raised and take them into account in subsequent decision-making. Significant and unresolved disputes over plans would signal to the regulator where the level or specification of proposed capex plans might be inappropriate (from an airline perspective). This would provide the airport with incentives to reach agreement with the user groups, but the process would need to be concerned with diluting accountability.

3.17 While the CAA is strongly in favour of co-operation and consultation between the airports and users, there are a number of potential problems:

- some users have expressed an opinion that airports do not fully consider their views expressed in consultation. If the airlines require an effective ‘veto’ to ensure effective consultations this will dilute airport management control and may reduce the flexibility that airport management needs to respond quickly to changes in a dynamic market;

- airlines may not properly reflect the views of passengers, and other ultimate beneficiaries of airport services. It is also suggested that airlines have a shorter time horizon for decision making than the airport, which must develop facilities with an economic lifetime of several decades. For this reason, airports sometimes argue that they are the guardians of the passenger. However, compared to the alternatives of no consultation, or directly seeking the preferences of the ultimate users of airports, airlines may be the best feasible option;

- quasi-contracting between airlines and the airport through the airport charges is subject to potentially significant free-rider problems. An airline will ‘vote’ in favour of projects it likes if it expects the cost to be borne by all airlines, including those that do not want the project. The significance of this latter problem will depend on how outputs are, or can be, segmented between users, how efficiently user groups reflect the views of all users concerned, and how similar or dissimilar the demands of users are. The recent development of airline alliances together with the Competition Act may reduce this concern;

- the incentives for strategic game-playing between the airlines could need to be investigated (i.e one airline backing capital investment that will increase charges to a level that will put other users at a competitive disadvantage or an airline blocking development to the same end).

The CAA invites views and evidence on how the role of users could and should be enhanced in informing the development of capital expenditure planning and monitoring.
Default Price Cap

3.18 Taking the role of an informed user group one step further, elements of the capex programme could be removed from the price cap, and provided following direct negotiation between users and the airport, within a default price cap approach\(^\text{13}\). This would be in line with the CAA’s statutory duty of minimum intervention under section 39 of the Airport’s Act.

3.19 A possible approach would be the provision of new facilities to be negotiated between the airport and users outside the price cap, either in bilateral or multilateral agreements, while the scope of the price cap is deliberately limited so that only use of current assets are included in the cap. An alternative would be to negotiate the use of specific existing facilities outside the cap, for example negotiate for the dedicated use of a single facility, such as a terminal building or part of a terminal building. In principle, this would allow users with different demands and service preferences to choose and negotiate for an improved service, such as higher service quality or greater capacity, which could only be provided by additional investment or use of specific existing assets.

3.20 A structure whereby the use of additional outputs arising from capital expenditure is negotiated outside the price cap may require long-term contracts between users and airports, particularly where the investments are user-specific. Negotiating for the use of such facilities before they are constructed would provide better signals for future demand for that capex. This structure would also improve the prospect that investment specifications were in-line with user’s requirements. Where airlines are able to exercise choice based on alternative combinations of price and quality, airports should have an incentive to build facilities to airlines’ preferred specifications and to identify and price outputs, including quality, accordingly.

3.21 As with any long-term investment, there is a risk that changes in demand (for any of a number of reasons, i.e. technological change, annual throughput) may mean that terminal facilities become redundant at some point in future. In the case of airports, the level of risk associated with long-term commitments may be increased given the more volatile nature of the airlines’ market compared to the more fixed nature of investments. However, allowing users and/or the airport to re-sell the outputs specified in the contracts, as seen in contracting for use of oil pipelines, could mitigate this problem. The structure of such a re-sale arrangement will need to consider the optimal division of risk between airlines (that acquire transferable rights) and the airport (that can charge annuitised costs).

\(^\text{13}\)A full discussion of the issues associated with a default price cap approach will be provided in a separate forthcoming CAA consultation paper. See also the discussions in the CAA’s paper on service quality, op cit.
3.22 Countervailing power of users in negotiation will be important when considering ways that contracts for new capex and existing assets could be remunerated. Effectively, contracting outside the price cap for new capex projects would give BAA the right to set the price for the use of new (and possibly some existing) assets.

3.23 The level of bargaining power would determine the extent to which users would be able to constrain incentives for airports to price access to additional capacity at monopoly levels. The degree of user's bargaining power in the process would depend on a number of factors:

- the terms and conditions for access to existing facilities offered to all users through the default price cap;
- the level of airport congestion (it is unlikely that at a congested airport any single user will have effective bargaining power in a negotiation process, at uncongested airports the situation is less clear);
- the airline's share of total traffic at that airport; and
- the airline's passenger mix.

3.24 Of the above factors the most important is the terms of the default price cap. If the level of service provided under this cap is a feasible option for the airline then their negotiating position will be strengthened. If an airline is unable to negotiate a deal with the airport because the airport is asking too high a price, the airline will be able to use the default level of service.

3.25 If certain users do have effective bargaining power, for example in the case of a large airline operating at an uncongested airport, users negotiating individually outside the cap for use of facilities may affect the competitive position of airlines. One of the benefits of the default price cap approach is that it permits differentiated users to contract for differentiated services. There would however be legal safeguards against such price differentiation going too far. Competition law would apply to discrimination, which amounted to an abuse of a dominant position, or agreements that were anticompetitive, and the Airports Act's complaints procedure could be utilised.

3.26 If the scope of charges outside a default cap is widened, the framework will have to consider how to structure separate charges for use of incremental assets when these are utilised alongside original airport assets included under the default price cap. For example, a user of a dedicated terminal facility would still require use of the runway. The structure of charges will also need to consider the effect of contracting for incremental capital on charges for users of assets that are within the default cap. For example, would there be the implication of higher prices, at least initially, for users remaining within an average revenue yield based default cap if a significant user transferred all operations to new facility outside the price cap. Therefore a default price cap structure may have to move away from an
average yield basis. The structure of charges under a default price cap will be discussed further in a future CAA consultation paper addressing default price cap issues.

3.27 The forthcoming consultation paper will address how the workings of a default price cap could be facilitated, for example by making bilateral deals transparent and information on such deals public, or by carrying out such deals in a framework organised by the regulator. Also, consideration will be given to the possible “externalities” resulting from a default price cap for capex. For example whether an airline would be incentivised under this structure to negotiate exclusive use of a facility that is currently, or when constructed will have the potential to be, a common user facility, such as a particular terminal gate, even if the airline did not expect to fully utilise the gate. The strategy behind such behaviour may be to reduce the amount of facilities available to competitors, at the detriment of overall airport operational efficiency. Any agreements entered into will, of course, be subject to the Competition Act and the Airports Act complaints procedure.

3.28 Finally, such a charging framework will need to address how to manage the incentives for airports to transfer as much of the asset base as possible into the RAB under the regulated cap.

**Appropriate facilities**

3.29 The applicability of a number of issues raised above will depend on the type of facility in question. Some airport outputs are already subject to individual facility agreements, and precedents exist for individual users to have differential access to airport facilities. Examples include the Fast track\(^\text{14}\) scheme at Heathrow and Gatwick airports, CIP lounges at both BAA and Manchester airports, and the baggage tunnel between T1 and T4 at Heathrow.

3.30 The most appropriate facilities will be new dedicated stand-alone facilities provided to the airlines, e.g. some terminal facilities, particular areas of a terminal for check-in or particular gates or air-bridges. Structuring the charges for use of these facilities will be facilitated if the airline does not make use of common use facilities included in the default price cap.

3.31 The scope of this approach may be extended where airlines group together and contract for incremental capex on a multilateral basis. Such an arrangement may be more practicable in future where particular alliances of airlines may be co-located in the same terminal, but alliances that have so far not proven themselves to be stable over time may be unwilling or unable to enter into a long-term contract.

\(^{14}\) Preferential security procedures for premium passengers.
The CAA seeks views and evidence on which facilities might be candidates for contracts outside of a default price cap.

Link with other CAA work strands

3.32 A number of other work strands concurrently considered by the CAA will also address and impact upon capital investment issues. These are briefly summarised below:

3.33 If possible, the separation of estimated costs for price cap purposes from the firm’s own cost base through effective benchmarking techniques would provide good incentives for the regulated firm to make appropriate investment decisions, and to implement them efficiently. Where price regulation is based on the airport’s projected and out-turn investment, the airport will have incentives to ‘game’ the system. The more that prices are set by reference to benchmarks which are external to the firm, so long as they are in line with long run incremental costs, the better the incentives to invest appropriately.\(^\text{15}\)

3.34 The CAA is also investigating the possibilities of a pricing approach based on incremental costs, involving a movement from the current pricing regime based on average accounting costs to one that is founded on forward-looking incremental costs. By reflecting the more appropriate cost base for making investment decisions, incremental cost based charges would reflect the costs of adding additional capacity. In principle, this should provide good incentives to make appropriate investment decisions as demand for new facilities would be signalled by a willingness to pay an incremental cost based charge. This will be discussed in a future CAA consultation paper.

3.35 The effects of a switch from a single to a dual till framework on investment incentives are unclear. A move to a dual till might affect the level of investment, as well as the division of investment between aeronautical and commercial activities. Overall, incentives to invest are expected to be greater under a dual till than a single till. By removing commercial revenues from the price cap the planning horizon on which commercial investments are made may be extended. Regarding the balance of investment between aeronautical and non-aeronautical activities, the effect of a movement to a dual till system at constrained airports is ambiguous, given the relative changes in opportunity costs, benefits and demand complementarities.\(^\text{16}\)

3.36 Increasing competition in the provision of facilities between airports could potentially both enhance and weaken investment incentives compared to the

\(^{15}\) For full discussion of benchmarking issues see: The use of Benchmarking in the Airport Reviews, Consultation Paper, CAA December 2000 (available at www.caaerg.co.uk)

\(^{16}\) For full discussion of single/dual till issues see: The ‘Single Till’ and the ‘Dual Till’ Approach to the Price Regulation of Airports, Consultation Paper, CAA December 2000 (available at www.caaerg.co.uk)
current situation. Incentives for monopoly under-provision would be reduced, but investment incentives could be damaged if increasing competition between facilities at a single site produced significant externalities in terms of operational efficiency. Additionally, the alteration of an airport’s property rights could weaken incentives, although this may be mitigated if the property rights were clear and could be effectively priced and traded. However, increased competition could improve investment incentives to build new facilities if the third party provider did not enjoy scarcity rents at the airport site.

3.37 If outputs could be better defined and priced accordingly, as outlined in the CAA’s quality of service paper\textsuperscript{17}, would result in better capex incentives.

These issues are discussed in other consultation papers published by the CAA and detailed comments on them are not requested here. Nevertheless, the CAA invites views on how the frameworks laid out in this paper might compare to these alternatives, and where ‘alternatives’ are complementary.

\textsuperscript{17} Op cit.
4. **The Town and Country Planning system**

4.1 The CAA recognises that alongside the incentive regime, the planning system, which aims to ensure that the external costs of aviation are fully incorporated into development decisions, is also important. The influence of the planning regime may be such that economic regulation alone may not be able to provide sufficient incentives for airports to be able to invest in major facilities, such as terminals and runways, where these require formal planning permission under the Town and Country Planning Acts. The planning process addresses a set of costs and concerns that are external to the aviation market, such as environmental costs and benefits.

4.2 Under the Town and Country Planning Acts planning permission is required for building or engineering operations on land or change in land use. Following consultation with BAA, the CAA understands that the process for applying for planning permission is as follows:

- the developer applies to the Local Planning Authority (LPA) for consent for development along with a statement of the environmental impacts expected with the project;

- the LPA undertakes local consultation with affected parties;

- negotiations take place between the LPA and the developer to see whether the scheme can be modified to minimise objections;

- the decision is made by the LPA, either to accept the application, with or without conditions, or refuse the application stating reasons for doing so;

- if the consent is refused the developer may appeal to the Secretary of State who will appoint an inspector to report on the appeal;

- for minor schemes the inspector may be able to approach the issues following written submissions, however more significant schemes will require a public inquiry;

- normally during an administrative hearing, the public inquiry will listen to the views of all interested parties, allowing each sufficient time to submit their views;

- the inspector will write a report on the application and the inquiry, and his subsequent recommendations. In many cases the inspector is expected to decide the appeal. Where the proposal is very significant the recommendation is submitted to the Secretary of State;

- the Secretary of State makes his decision, which may be challenged in the High Court on a point of law. It may also be subject to judicial review.
4.3 Airports do have various planning advantages that allow some projects to be approved outside the conventional planning process, but the scope for these to increase capacity is limited. For example, although airports enjoy powers of "permitted development" under General Permitted Development Orders\textsuperscript{18}, these powers have been virtually exhausted at Heathrow and Gatwick.

4.4 The standard planning process is therefore the route that most development applications must take. Based on BAA’s 1999/00 CIP, the CAA expects that approximately two-thirds of BAA investment (in nominal terms) over the 10-year period to 2009/10 would be subject to the standard planning process. However, given the cost and complexity of the planning process, airports are increasingly engaging local communities and LPAs in an effort to achieve the earliest approval by negotiating acceptable schemes to avoid or to expedite the planning process.

4.5 The example of Terminal 5 planning inquiry demonstrates the length of time and the cost that a planning inquiry can involve for major projects. At the last regulatory review it was assumed that the terminal would open in 2003\textsuperscript{19}. However, following an inquiry programme that lasted from May 1995 until March 1999, the current earliest date for opening is now 2007 depending upon a favourable planning decision (the decision is expected in 2001).

4.6 As a consequence of such large-scale inquiries, the UK Government recognised that the processing time for planning applications for major projects is too long and published a paper\textsuperscript{20} in May 1999, requesting views on how the process might be streamlined while still allowing all interests to be considered. The issue has also been raised in the DETR’s recent consultation document on air transport policy\textsuperscript{21}. Conclusions of this process are expected in due course and may include suggestions to publish a statement of national policy before major projects are considered in the planning system. The forthcoming air transport white paper could provide such a national policy statement for airport development.

4.7 The largest investment issue facing South-east airports is whether, where and when new capacity in the form of an additional runway capacity will be provided. The Government is currently assessing this issue within its South-East Regional Air Services Study. In its recent CIP BAA has stated that it is prepared to build

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\textsuperscript{18} GPD\textsubscript{O}s allow engineering works to be carried out in airfield areas and extensions to terminal buildings up to 15% of the original terminal floor space without the need to apply for planning permission (although the LPA must be notified) unless the Secretary of State decides otherwise in a particular case. This reduces the amount of time needed for the planning process.

\textsuperscript{19} At the past BAA review it was accepted that there was uncertainty over what the T5 decision would be, and contingencies were made for this. However, these contingencies did not cover the possibility of a substantial delay in the decision being made.

\textsuperscript{20} DETR, Modernising Planning: streamlining the processing of major projects through the planning system, May 1999

the runway option selected by Government, if asked to do so, provided the project is economically viable.

4.8 In light of the above, the CAA accepts that planning constraints are clearly important and represent a significant addition of costs and uncertainties that need to be accounted for in developing a capital expenditure programme. However, the level to which they are a binding constraint may only apply in an absolute sense to very large scale and politically contentious projects, such as runways, although even in these cases the outcome of such a process is uncertain, especially without projects being properly tested. Outcomes will obviously be affected by the efforts of the project developer. It remains that the assumption is that for many areas of capex, with the exception of a few large projects, the planning process does not provide an absolute constraint. Validation of this assumption will be a key area of investigation.

4.9 In some circumstances an airport might not have strong incentives to develop new capacity, but could overstate the difficulties raised by the planning process as a rationale for not bringing forward new capacity. If this were found to be the case, one solution to this would be if other parties were permitted to propose new developments and, if the airport declined to pursue them, pursue the proposals themselves and undertake the developments accordingly. Since the airport is likely to be in a position to prevent this (for example by refusing to lease land or provide access to necessary facilities) there may be the need for regulatory or competition law oversight.

| To what extent is the planning regime a binding constraint? How does this differ between different developments? |
| How can the regulatory framework best incentivise appropriate investment given planning constraints? |
5. Conclusions

5.1 Capacity in the South-east and service quality are two of the key issues faced by UK aviation, and by this review. Capital expenditure is critical to both. The standard model of regulation has recognised deficiencies in providing optimal incentives for the airport to invest appropriately. By remunerating capital investment at the cost of capital, without explicitly recognising the benefits provided, the standard model does not in itself provide good incentives for the firm to plan the best investments. And the usual methodologies of rolling forward the regulatory asset base at reviews can provide incentives not to undertake investments, even if they are worthwhile.

5.2 One solution, which has been adopted by some other regulators, is to review capex plans, to ensure optimality and monitor implementation. While the CAA understands the rationale for this in the context of the imperfect incentives of the standard framework, this entails serious risks of loss of accountability and involving the regulator as a second tier of management. The CAA’s view is that in the case of airports, the case for a full capex review, with the CAA taking views on which projects are desirable and how much they should cost, is not justified at this stage.

5.3 Better alternatives could be provided by better specification and pricing of outputs (including service quality), separation of the price cap from the airports’ own costs through benchmarking, or setting prices to reflect incremental costs (rather than average costs). Increased contracting outside of a default price cap could also provide a solution, particularly if parties other than the airport were able to propose new projects. These are addressed in other papers published by the CAA.

5.4 The final option, which would be an important complement to the other approaches (benchmarking, incremental cost pricing) is to enhance the role of users in determining the airports’ capital expenditure programme. This would require full disclosure of information, probably in the form of a fully specified business plan, on demand projections, capacity projections, the capital expenditure plans, operating cost projections and associated charging profiles. This information would need to make clear the trade-offs being made, and the alternatives that had been tested and discarded. Ultimately, the more users can be said to have made a fully effective contribution to the process in the light of such information, and airports have taken proper account of these contributions, the weaker the case for a capital expenditure review.
Annex 1

Traditional regulatory model

Price cap regulation provides a ceiling to charges that is set at fixed intervals (five years in the case of UK airports). This ceiling will allow the firm an expected rate of return for its regulatory assets based on forecasts of volumes, revenues and costs including capital costs. Projections of future costs will include the depreciation and capital charges on the RAB including that associated with the planned spend on the capital investment programme. The regulator will consider whether this adequately and efficiently addresses future user needs. These projections are added to the RAB and therefore included in RAB amortisation calculations.

By setting the charges for fixed intervals, the firm is provided with strong incentives to outperform projections until the next price review, when the regulator resets the price cap taking into account the efficiency gains achieved over previous period. In principle the firm will have an incentive between reviews to achieve cost saving efficiencies on the stated investment plan as they will retain any savings.
Annex 2

Investment incentives under the traditional model

At the heart of price cap framework is the belief that information asymmetries inherent in any regulatory regime should preclude imposition of ‘correct’ solutions on the regulated firm by the regulator. Therefore emphasis should be on regulation by incentives. The current ‘standard’ regulatory framework combines the incentives of rate of return regulation with significant dynamic features, mainly concentrating on the behaviour of the regulator. Incentives can be split into those affecting two distinct phases of investment:

• incentives at the planning stage to choose the ‘right capex’ i.e. ideally the projects that have positive net present value at efficient prices (including option values) and at the least cost; and

• incentives for the efficient adjustment (to new information) and efficient implementation of the capex plan.

Incentives to choose the right capex

Within the traditional framework, contradictory incentives exist - those to over invest and those to under invest. There are also incentives to invest in the wrong projects. Incentives to over capitalise are a consequence of the rate of return element of framework and result from:

• the firm’s expected return being greater or equal to its true cost of capital; and

• the regulator being expected to allow the assets created to be added to the Regulatory Asset Base (RAB).

This over-capitalisation incentive is illustrated below.
The investment possibilities frontier represents the maximum profit that the regulated company can derive from various levels of capital base, assuming declining marginal returns from investments. The true cost of capital (CoC) is drawn at a constant slope, representing a constant cost of capital for all levels of investment. The rate of return that the regulator offers the regulated company (regulatory RoR) has a slope higher than the true cost of capital, indicating a rate of return higher than the firm's cost of capital. Without a rate of return equal to or greater than the true cost of capital the regulated company would not invest.

If there was no regulation, the company would maximise economic value where the marginal return from investment equals the true cost of capital, point Km. However, as the rate of return provided by the regulator exceeds the true cost of capital, the regulated firm will have an incentive to expand its capital base until the investment possibilities frontier becomes the active constraint, point Kr. As a result the firm will make investments between the points Km and Kr that produce a return below the true cost of capital. The extent of this problem will depend on the difference between the allowed rate of return and cost of capital and the focus should be on as accurate an estimation of the firm's cost of capital as possible (noting the difficulties inherent in this and the asymmetric risks of estimation errors).

However, the firm also faces the risk that the regulator will, in later price cap reviews, 'disallow' part or all of investments and therefore remove them from calculations of the RAB. The more the regulator understands the relationship between the company's investment programme and the performance and value of outputs, the greater the incentive for the company to ensure that its investment decisions are underpinned by normal commercial and economic criteria. However, there is a risk that through the application of hindsight the regulator may dampen investment incentives, being unable to distinguish between investments that do not produce the desired outputs because of influences that are out of the firm's control and those that under-perform because of sub-optimal effort by the firm.

Ideally, regulators set maximum price levels for desired outputs to encourage the firm to implement appropriate investments. However, this assumes that the purpose of the investment can be identified and that the outputs can be accurately and appropriately measured and priced. The multiple output nature of capital investment at airports will complicate this and make output valuation difficult. This process will also be complicated as multiple users may value outputs differently.

Under-investment is a problem when there is a perceived risk that the regulator will act opportunistically, expropriating the sunk cost nature of the firm's capital investments. This 'time-inconsistency' risk can result if the regulator is unable to pre-commit to a future pricing policy that accounts for the sunk costs of current investment. This perceived risk would also result in long-term investment being substituted for investment with shorter payback periods (i.e. payback before the next regulatory review).

If a regulator could commit to a 'fair' price (i.e. covering the firm's total costs), investment incentives would be enhanced. This could result from a US-style legal or constitutional right to earn a fair return on investments that fully recovers costs.

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However, this would reduce the incentive to distinguish between different types of investment, as inefficient and unnecessary projects would be rewarded at the same rate as efficient projects.

Professor David Sibley argues that efficient investment incentives will result from the regulator adhering both to the price cap plan within the five-year period and to the price cap formula at regulatory review. Divergence in either case should be carried out according to clearly specified criteria that do not involve the retroactive extraction of profits.

It appears clear that a strong regulatory reputation and consistent regulatory approach is the most effective way to overcome the credibility problem. However, regulators must consider all information available to them when exercising their statutory powers so the time inconsistency problem is inherent. Therefore, an implicit trade-off must be made.

It has been argued that because airport outputs and service quality are not precisely measured and priced, airports have some difficulty in rigorously assessing competing proposals. While costs can be assessed, the benefits may or may not translate into economic benefits for the airport. This problem is compounded by the RAB approach in which every £ of capex spend is expected over time to earn a normal rate of return regardless of the benefits generated. Both of these problems point towards an output-pricing approach.

**Incentives for efficient implementation of capex plans**

Once the price cap has been set, the regulatory framework will provide mixed incentives for investment over the inter-review period. In principle the firm will have an incentive to achieve efficiencies and retain the implied return from any savings made on the investment plan. However, the same principle may provide firms with an incentive to under invest, or delay capex, while still earning a price that reflects planned capex (assuming that there is a less than perfect link between prices and outputs). This incentive will be reinforced if the perceived level of regulatory risk, i.e. if the firm’s expectation of ex post opportunism by the regulator regarding provision of return on previous investments, is high.

In an environment where the perceived level of regulatory risk is high, the standard framework may also incentivise the firm to invest in assets that have a short-term horizon (as mentioned above). In this context, a short-term repayment period is one where the returns will fall for the most part before the end of the current pricing period.

The fixed period of the review will provide the firm with a motive for regulatory ‘game playing’. For example, the firm may inflate the expected estimates of capex needed to produce a certain level of outputs over the price review period and then claim subsequent differences between actual and expected capex as efficiency gains.

Incentives to minimise the cost of investments are also inconsistent during the period, as efficiency gains made immediately after the review are retained longer than gains made just prior to the subsequent review. Therefore, incentives for efficiency savings in capex

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23 David S. Sibley, ‘Economic Analysis of the Civil Aviation Authority’s Initial Incentive Regulation Proposal for the National Air Traffic Services’, CAA, July 2000
decrease during the regulatory period. Additionally, there will be greater incentives to over-capitalise later in the review period to inflate the RAB for the next review period. This problem is acute where the project has a long lead time, such that by the time that the project generates a return, its costs are known to the regulator and incentives to reduce the costs of investments are correspondingly lower.

In principle the regulator could take such behaviour into account with BAA and Manchester understanding that (allowing for changes in circumstance) they will be penalised at the next review for non-implementation of investment plans. However, without an output-based approach, it is difficult to distinguish between deviations from the capex plan resulting from appropriate adjustment to new information, efficiency gains, and those that are not attributable to best practice by the regulated firm.

**Incentives under the calculation of the RAB**

Under the standard model the treatment of the RAB is crucial in ensuring the investment environment should provide investors with the expectation of being able to achieve at least normal returns for appropriate and efficient (i.e. legitimate) investment, therefore providing airports with sufficient incentives to attract capital for socially profitable investment.

CAA’s approach to calculating the level of the RAB changed at the last review. Previously the RAB was calculated through a replacement cost approach that was considered unsuitable due to the volatile nature of building costs included in the calculations. However, at the last review it was rolled forward for each year of the price control period, while being indexed to the RPI, being adjusted upwards for actual net new investment, and downwards according to the depreciation provision. This ‘roll-over’ approach is consistent with the 1997 MMC report on British Gas, and the OFWAT method to calculate water companies’ capital value.

‘Rolling forward’ the value of the RAB means that the RAB more closely represents shareholder’s investment in the company, but implies a very high pre-commitment from the regulator not to act opportunistically, disallowing ‘sunk’ investments. If credible, this should reduce the cost of capital and encourage appropriate and efficient investment. However, the approach insulates investors from the risk that any investment might become partially or wholly economically obsolescent and consequently dulls the incentive to anticipate future best practice. This is inconsistent with economic efficiency and may constitute a “tax” on consumers. Whether it is still appropriate and/or necessary in a low inflation environment is another issue.

The general concept of price indexing the RAB is consistent with other regulators’ methodologies and reducing regulatory uncertainty. However different regulators’ RAB calculations differ in respect of whether anticipated or actual new investment should be added to the RAB. Whittington²⁴ identifies three options for incorporating investment into the RAB and their associated efficiency incentives:

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• add actual expenditure for the past period to the RAB and subtract any excess returns due to under spending (there may also be compensation given for over spending);

• add actual expenditure onto the RAB without claw-back or compensation (current CAA approach); and

• retain the anticipated expenditure in the RAB with no adjustments for actual spend.

Option one reduces efficiency incentives and should only be implemented if the regulator does not trust the original projections or if there were significant changes in circumstances. Option two provides strong incentives to inflate investment plans up front, and some incentives to invest efficiently provided that the return on the total asset base exceeds the cost of capital. In this case efficient investment will mean that the company obtains a return on new investment of not less than the cost of capital, plus a reasonable return on existing assets. Option three provides strong efficiency incentives compared to original capital forecasts where large, long-lived investment projects will offer potentially significant savings if they are well designed and managed. However, there will be a greater incentive to inflate the capex plan at regulatory review, and strong incentives not to subsequently undertake capex.

The calculation of depreciation will be crucial to the resultant size of the RAB, and within this, assets in the course of construction (AICC) will be significant. Currently, AICC are not included in depreciation calculations for airports, but they are included in the RAB. In recent proposals for NATS\(^25\), the CAA suggested that RAB calculations should also only include the assets that are operational, with financing costs being capitalised.

This system should also provide good incentives for the timely completion of projects and will shift the risk of developing projects from users to the airport operators, who are likely to be better able to manage this risk. Although deferring return on AICC and capitalising financing costs maintains incentives to invest, as completed investment would lead to a corresponding increase in the economic value of the RAB, it does not have strong incentives to make efficiencies. Moreover, the regulator must plausibly commit to subsequently setting a RAB that fully reflects investment attributable to the regulated activities, including their capitalised financing costs.

How should the RAB be rolled forward?

On what basis should new investment will be added to the RAB?

How should AICC be treated?

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\(^{25}\)CAA ERG, ‘National Air Traffic Services Public Private Partnership, setting the charge control for en route services in UK airspace for the next five years’, April 2000