

# Agenda

## Advancing economics in business

### The CAPEX factor—part 1: dealing with uncertainty in setting CAPEX allowances

**A central component of incentive regulation is determining an efficient level of future capital expenditure, which is rarely a straightforward exercise. This article, the first in a series on the issues surrounding CAPEX regulation, focuses on what regulators and regulated companies can do to set reasonable CAPEX allowances in the face of considerable cost uncertainty**

Incentive regulation is more than 30 years old, and its impact on efficiency is well publicised. It has been particularly successful in driving down operating costs (OPEX), where it is relatively straightforward (at least, in theory) for the regulator to establish a baseline level of expenditure and apply an efficiency overlay.<sup>1</sup>

There is often greater uncertainty around the efficient level of CAPEX, particularly for enhancements, for a number of reasons.

- While OPEX tends to be built up from recurring cost items that are required for the day-to-day operation of the business, and is therefore relatively stable over time, CAPEX often reflects one-off projects and can be inherently lumpy. Spend in recent years can therefore be a poor indicator of required spend in future years.
- Given the one-off nature of many projects, neither the company nor the regulator will necessarily have experience of forecasting the cost of similar projects in the recent past.
- Projects can take a long time to deliver and require forecasting further into the future than OPEX. Cost estimates inevitably become more uncertain, the longer the forecasting period.
- Given the long lead and construction times, the precise scope of projects can also change over time. This means that the final asset may bear only a passing resemblance to the project specification on which today's cost forecasts are based.

For these reasons, the company's own 'best' forecast of the project cost may be subject to considerable uncertainty and/or bias; and the regulator's ability to develop a knowledge

of the cost base in the same way as for OPEX is likely to be limited.

A key issue that regulators have faced in the most recent price review cycle in the UK is that a large number of projects have been at an early stage of development at the time of the price control determination. This has added to the uncertainty around the companies' cost forecasts and the scope of their CAPEX plans. The problem has been particularly acute in the GB rail and airports sectors, for example, as shown in the box overleaf.

The recent issues in the GB rail sector, and the ongoing challenges faced by other sectors, highlight the difficulties of regulating CAPEX in the context of considerable cost uncertainty, and raise a number of questions for future regulation.

#### **Should all CAPEX be assessed in the price review process?**

Given the issues with scrutinising certain aspects of companies' CAPEX programmes, is it suitable to attach firm values to all investments once every five years, or are there other potential options for certain categories of expenditure (such as enhancements)?

As suggested above, five-year price/funding settlements have arguably worked best in terms of incentivising efficiencies in OPEX and recurring CAPEX (such as capital maintenance and renewals). Indeed, the Bowe review (see the box above) has recommended that the UK Department for Transport consider whether a greater proportion, or even the entirety, of the enhancement spend should be removed from the regulatory settlement, with the existing regulatory approach applying to the remainder of the cost base.<sup>2</sup>

## CAPEX uncertainty in GB rail and UK airports

Independent reviews of the CAPEX programmes undertaken at the time of the PR13 GB rail and Q6 UK airports price control determinations have found that:

- 52% of Network Rail's enhancements spend for England and Wales related to projects that had yet to be narrowed down to a single potential delivery option, meaning that the project specification and associated cost estimates could be subject to considerable revision;
- 87% of Heathrow Airport's projects were still in the pre-feasibility phase.<sup>1</sup>

In the rail sector, the consequences of this uncertainty have been significant. The PR13 determination incorporated spending of £38.3bn over the five-year control period (CP5), with £12.8bn allocated for an ambitious programme of enhancements. A little over a year into the control period, it became clear that Network Rail would be unable to deliver all these enhancements for the agreed level of funding, leading the UK Secretary of State for Transport to initiate a full reassessment of the CP5 investment programme ('the Hendy review'). Two further reviews—examining the governance and planning process for CP5 ('the Bowe review') and the future structure and financing of Network Rail ('the Shaw review')—were announced at the same time.

The Bowe and Hendy reviews<sup>2</sup> were published in November 2015 (the Shaw review was published this month alongside the 2016 Budget), with the former identifying a number of issues that combined to make the enhancements programme undeliverable. These included:

the fact that the overall plans encompassed a complex portfolio of schemes, subject to poor scope definition from the outset and ongoing 'scope creep' which led to cost increases...when it came to delivery, early costing errors, unanticipated interdependencies, lower than expected productivity and the failure to ensure agreed front end scope definition have also contributed.<sup>3</sup>

Subsequently, the sector regulator, the Office of Rail and Road (ORR), has been subject to criticism, particularly regarding its approach to reviewing efficiency, scrutinising Network Rail's business plans, and assessing deliverability. Both the Bowe review and the inquiry report of the Public Accounts Committee have emphasised the need for more robust governance of the capital planning process and a stronger focus on deliverability (including supply chain implications) for future price controls. More radically, the reviews have questioned whether it is appropriate to set cost allowances for large, one-off investments in five-yearly price reviews, given the level of cost and scope uncertainty at the time of the periodic review.<sup>4</sup>

Note: <sup>1</sup> Alan Stratford and Associates (2013), 'Q6 CAPEX review Heathrow Airport', prepared for CAA, November. <sup>2</sup> Department for Transport (2015), 'Report of the Bowe Review into the planning of Network Rail's Enhancements Programme 2014-19', Cm 9147, November; Network Rail (2015), 'Report from Sir Peter Hendy to the Secretary of State for Transport on the replanning of Network Rail's Investment Programme', November. <sup>3</sup> Department for Transport (2015), 'Report of the Bowe Review into the planning of Network Rail's Enhancements Programme 2014-19', Cm 9147, November, p. 6, para. 1.4. <sup>4</sup> House of Commons Committee of Public Accounts (2015), 'Network Rail's 2014-2019 investment programme', Ninth Report of Session 2015-16, HC 473, 20 November.

Expenditure could be treated outside the regulatory settlement in at least two ways.

- In some instances, responsibility for delivering large projects could be removed from the regulated company entirely, with the projects instead being delivered by a third party—either a private company (following a tendering process), or a separate public sector body. Examples of this approach include the Thames Tideway project, and the announcement by Ofgem (the energy regulator for Great Britain) that it will introduce competitive tendering to deliver onshore electricity transmission projects worth more than £100m for which the assets are new and separable from the existing network.<sup>3</sup> Such an approach has the potential to drive efficient delivery (through competition), while reducing the risk borne by the core regulated business.
- Even for enhancement projects that are to be delivered by the regulated entity, it may be appropriate to assess and fund some of them outside of the periodic review process. This approach has been used in the GB rail sector for some 'mega' projects—such as Crossrail and Thameslink—but the criteria for deciding whether to separate projects out from the funding cycle have not been explicit. Consequently, it is not clear why certain projects (such as electrification) have been included in the five-year funding cycle, whereas others have been subject to bespoke arrangements. For example, certain enhancement projects could be excluded from the periodic review process based on their value or complexity, or their stage of development (and the level of confidence in the forecasts) at the time of the review.

It would be remiss of an article on CAPEX regulation not to mention London runway capacity. It is highly unlikely that the construction or operation of a new runway at Heathrow or Gatwick airports would ever be put out to competitive tender, but it is a project that exemplifies many of the problems of dealing with a major enhancement within a regulated asset base (RAB) framework. The regulator's favoured approach is for the market to overcome these problems through commercial negotiation between the airport and airlines.<sup>4</sup> It remains to be seen how, or whether, this will play out in practice, but it is an innovative proposal that would take the concept of customer engagement—as used in a number of sectors—one step further in a UK regulatory context.

## How should regulators deal with forecasting uncertainty when setting CAPEX allowances?

The cost forecasts submitted by companies at the time of the periodic review process may be subject to error as a result of factors including:

- the inherent uncertainty associated with big, complex projects;
- non-deliberate biases (e.g. optimism or pessimism bias);
- deliberate attempts by the company to 'game' the regulator by overestimating costs.

Regulators have given considerable thought to how to prevent companies from 'gaming' the process by knowingly putting forward inflated cost estimates for capital projects (e.g. through the introduction of menu regulation). However, in the current context the regulators' dilemma has not been whether cost forecasts are 'truthful' but whether, given the level of cost and scope uncertainty, they are robust.

It is worth noting that the problem of estimating project costs is not restricted to regulated companies or to the UK. For example, a 2009 study found that 90% of 258 transport infrastructure projects reviewed had cost overruns (with an average overrun of 28%).<sup>5</sup> It is not difficult to think of comparable case studies from recent years, such as Berlin Brandenburg Airport, the Fyra high-speed link between Amsterdam and Brussels, or Edinburgh Trams.

Consequently, regulators need to consider how to deal with forecasting uncertainties for those costs that do feed into the periodic review. There are several possible considerations.

- **CAPEX and OPEX, or TOTEX?** Several regulators have moved to a total expenditure (TOTEX) approach to cost assessment and recovery, rather than treating CAPEX and OPEX separately.<sup>6</sup> This approach avoids the need to undertake a detailed review of cost forecasts for individual projects, and may reduce the bias towards CAPEX solutions. Additionally, TOTEX may, in some instances, be more stable over time and more comparable between companies than CAPEX. However,

TOTEX cost assessment and benchmarking can still be problematic in the face of large capital enhancements projects, and does not directly tackle the issue of forecasting uncertainty.

- **Contingency margins.** When forecasting the cost of projects, companies and regulators can include an allowance for contingency to provide a buffer against overruns relative to the central cost estimate. Contingency margins can be set in advance to provide headroom so that there is less exposure to the risk that the costs of investment projects will exceed forecasts. Contingency allowances can be established on a project-by-project basis or as a central pool for the entire investment portfolio, and the level of contingency can be set with reference to typical optimism bias adjustments or by looking at the actual costs of a comparator set of projects (e.g. 'reference class forecasting'). However, care needs to be taken to ensure that contingency margins do not weaken incentives for efficient delivery, and that companies do not receive a windfall gain where risks outside their control do not materialise (for example, through claw-back of the contingency margin).
- Other more general approaches to uncertainty surrounding efficiency forecasts could also be used, such as real price effects, and the size and profile of efficiency savings.

If the regulator does not make an explicit allowance for contingency in setting the CAPEX envelope, it may be appropriate to capture investment risk in the allowed rate of return. For example, the New Zealand Commerce Commission has consistently adopted a policy of setting the WACC above the 50th percentile of the estimated range.<sup>7</sup>

## What is the role for change control mechanisms in dealing with cost uncertainty?

As an alternative to dealing with cost uncertainty at the time of the price review, regulators can address it by allowing for changes to cost allowances within the control period.

Some regulators typically deal with small scope changes within regulatory periods by logging up or down at the end of the control period. For certain categories of cost (such as environmental expenditure in the water sector), the company is allowed to 'log up' net additional costs (where these are efficiently occurred), while any decrease in expenditure resulting from a reduction in required outputs is 'logged down'. To deal with more significant changes in circumstance, the price control can be reopened, with re-determination of a single parameter or a wider set of parameters. However, the reopening of a price control is typically seen as an option of last resort—frequent reopeners are likely to dilute (and potentially distort) incentives, and the negative press surrounding the re-determination of Network Rail's enhancements programme highlights why regulators are typically loath to revisit their decisions.

In a more targeted attempt to combat cost uncertainty, both the ORR and the CAA have introduced mechanisms to make within-period adjustments to cost allowances for CAPEX projects that were at an early stage of development at the time of the review. Under these mechanisms, the regulators set indicative allowances for early-stage CAPEX, but these allowances could be adjusted within period once the project reached a certain investment gateway and more robust cost forecasts were established. This approach can be a genuine and reasonable attempt to reduce the impact of uncertainty at the time of the periodic review but, in the case of Network Rail, has not been sufficient to prevent the need for a full review of the entire enhancements programme. It is notable that the majority of schemes that have gone through this process have increased in cost within period.

One further development in the UK is worthy of mention—the outcome of change control processes has typically, but not necessarily, been regulator-driven. The CAA has recently published a policy update on how costs associated with Heathrow or Gatwick obtaining planning permission for additional runway capacity—which were not included in Q6 allowances—should be recovered through airport charges.<sup>8</sup> The CAA hopes that the airports and their airlines will agree their own risk-sharing arrangements around the recovery of these costs through commercial discussions, and the regulator will intervene only if agreement cannot be reached.

## Moving forward

CAPEX regulation remains complex and, in the context of a significant infrastructure investment programme, the need for regulators to adopt robust approaches to scrutinising, incentivising and (where necessary) adjusting capital investment allowances is as great as ever. Large, one-off enhancements pose a particular regulatory issue and there may be further calls for the removal of such schemes from five-yearly review processes—either through bespoke governance arrangements or, more radically, third-party delivery (and, potentially, ownership).

Where projects remain in the regulatory cycle, greater consideration will be needed of how to treat forecasting uncertainty. Ultimately, however, such mechanisms might only ever fix the symptoms rather than the cause. Robust forecasting requires robust corporate governance, and a culture that encourages best practice. Particularly in a public sector context, the regulator may be better served by ensuring that the company's internal incentive schemes (such as remuneration packages) provide appropriate incentives for senior management to scrutinise and question cost forecasts, and by securing an appropriate level of board assurance.

<sup>1</sup> In reality, details must still be worked out regarding inflation, economies of scale, real price effects, the treatment of uncontrollable costs, assessing the scope for efficiencies, and so on.

<sup>2</sup> The review recommended that: 'The Department should consider whether major route enhancement schemes (in particular) should continue to be tied to the periodic review cycle or whether they should be handled under bespoke arrangements such as those in place for Crossrail and Thameslink. This would provide Ministers with opportunities to decide how to progress schemes as deliverability and affordability is progressively assured, rather than artificially accelerating schemes to meet the requirements of the access charge review and would incentivise better early planning and programme oversight.' Department for Transport (2015), 'Report of the Bowe Review into the planning of Network Rail's Enhancements Programme 2014-19', Cm 9147, November, p. 40, para. 6.22.

<sup>3</sup> Ofgem (2015), 'Integrated Transmission Planning and Regulation (ITPR) project: final conclusions', 17 March.

<sup>4</sup> Civil Aviation Authority (2015), 'Economic regulation of new runway capacity', CAP 1279, 26 March, [http://publicapps.caa.co.uk/docs/33/CAP1279%20Economicregulationofnewrunwaycapacitynon\\_confidential.pdf](http://publicapps.caa.co.uk/docs/33/CAP1279%20Economicregulationofnewrunwaycapacitynon_confidential.pdf).

<sup>5</sup> Flyvbjerg, B. (2009), 'Survival of the Unfittest: Why the Worst Infrastructure gets Built—and What we can Do about it', *Oxford Review of Economic Policy*, 25:3, pp. 344–67.

<sup>6</sup> They include Ofgem, Ofwat (the economic regulator of the water industry in England and Wales), and the Italian Regulatory Authority for Electricity Gas and Water. See Oxera (2016), 'Electricity network regulation in Italy moves towards a new paradigm', *Agenda*, February, <http://www.oxera.com/Latest-Thinking/Agenda/2016/Electricity-network-regulation-in-Italy-moves-towa.aspx>.

<sup>7</sup> See Oxera (2015), 'Aiming high in setting the WACC: framework or guesswork?', *Agenda*, March.

<sup>8</sup> Civil Aviation Authority (2016), 'Recovery of costs associated with obtaining planning permission for new runway capacity: policy update', CAP 1372, February.