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How LRAIC might work in airports compared with other industries

Prepared for BAA

BAA/CC2008/1008

July 14th 2008

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Executive summary

This report reviews regulatory precedent in the application of long-run marginal cost (LRMC) pricing and related long-run average incremental cost (LRAIC) methodologies in the context of price cap regulation, and specifically how LRAIC might work differently in airports compared with other regulated sectors. It is written from the perspective of how the public interest consequences of introducing LRAIC at Stansted Airport might be evaluated and what the potential implications of introducing LRAIC for BAA might be.

The report identifies that varieties of LRAIC-type methodologies have an established theoretical basis in the economic theory, and are used to a greater or lesser extent in a number of regulated sectors including telecommunications, postal services, energy and water.

The manner in which these methodologies have been used in regulated sectors has reflected the rationale for their introduction. This is an important consideration in evaluating the application of these principles in other regulated contexts, as well as their relevance to airports regulation.

The rationales for the use of these methodologies in other sectors have included the desire to promote efficiency (allocative, productive and dynamic), investment, entry, and cost-reflectivity. These rationales have also reflected the economic characteristics of these other industries.

The principal motivation for presenting LRAIC as an option for consideration in the case of Stansted seems to be that it will reflect the forward-looking long-run incremental cost of investment and therefore encourage efficient investment, with the airport operator making choices more in line with pure business consideration without any potential distortions from the regulatory system.

In industries with rapidly changing technology and correspondingly short asset lives (such as telecommunications), the use of RAB-based regulation with historical costs might, in certain circumstances, lead to the misallocation of resources, suggesting the need for a forward-looking approach that reflects a replacement cost or modern equivalent asset (MEA) basis. In contrast, airports do not have all the economic characteristics that motivate the use of LRAIC in other sectors, such as rapid technological change or a diverse product range.

Therefore, the rationale for the use of LRAIC might be seen as somewhat more limited than in certain other sectors, and it might have consequences for the investment horizon that the company would need to consider.

It is also important to identify the details of implementation, and to establish how they may be expected to operate in airports compared with other sectors—eg, whether BAA would have complete freedom in deciding the optimal level and timing of investments. The details of the regime might significantly influence both incentives as well as risks faced by the company. This requires an evaluation of how the investment incentives that the airport faces may be expected to change, and, accordingly, how the risks that Stansted faces would change, under different versions of the potential LRMC-based regime. It also requires an assessment of how investment incentives and risks may be expected to differ under LRAIC compared with a RAB/WACC approach to setting charges, the implications of LRAIC at Stansted and RAB/WACC at Heathrow and Gatwick, and the consequences of adopting LRAIC for Q5 and subsequently the risk of reintroducing the RAB/WACC regime in the future, which is related to the problem of absence of regulatory commitment.

A move to LRAIC might significantly alter the risks that Stansted faces, including the types of risk, with consequences for the availability and type of financing. The final impact of this change, and the important practical details of any implementation, would require further attention before a position on the public interest consequences of LRAIC at Stansted can be established.

Contents

1 Introduction

This report provides a high-level review of the regulatory precedent in the application of long-run marginal cost (LRMC) pricing and related long-run average incremental cost (LRAIC) methodologies in the context of price cap regulation, and specifically how LRAIC might work differently in airports compared with other regulated sectors.[1]

The report discusses the conceptual basis for LRMC/LRAIC pricing, the rationale for the use of these methodologies in other regulated sectors, and the implications of moving to LRAIC pricing at Stansted Airport.

LRAIC-based pricing at Stansted would represent a substantial change in regulation, with significant implications for the risks and incentives faced by the airport itself, as well as other competing airports.

Consequently, the details of any implementation, including transitional arrangements and subsequent revisions to approach and methodology, are critical, insofar as they are likely to have material implications for the public interest and BAA.

The inability to provide regulatory commitment to a long-term pricing approach might constitute a fundamental barrier to the implementation of LRIC, thereby forgoing other merits of the approach. Such a change in the regulatory regime may also adversely affect airport financing and investors' perceptions of risk and returns, irrespective of the underlying economic arguments that may support its use.

[1] This report is complementary to 'Advice to the CAA on the Calculation of Incremental Costs', prepared by Europe Economics and presented as 'Supporting Paper IV' to the CAA's reference of Stansted to the Competition Commission. CAA (2008), 'CAA Reference to the Competition Commission for Stansted Airport Supporting Paper IV Advice to the CAA on the Calculation of Incremental Costs', April. That report was concerned with identifying the issues involved in estimating LRAIC, and its use in other sectors and circumstances. Other topics covered in the Europe Economics report include a review of whether the principles of the Competition Act 1998 might inform price-setting, and the relevant features of the market for airports in the south-east of England. This report considers some of these issues in more detail, extending them to include a comparison of LRMC methodologies with the RAB/WACC building-block approach to setting the price cap. The report focuses on the implications for Stansted of a move to LRAIC.

2 Review of application of LRAIC in other sectors

2.1 Long-run marginal costs and long-run incremental costs

The LRMC is the least-cost method of producing one more unit of output, allowing for the optimisation of all inputs, all other factors remaining equal. An alternative and equivalent definition is that it is the increment to long-run total cost attributable to the last unit of output produced. The LRMC is greater than the short-run marginal cost if some costs are variable only in the long run.[2]

It is an established economic principle that efficient resource allocation is secured by marginal cost pricing, subject to a number of assumptions.[3] The practical implication for airport regulation is that marginal cost pricing should ensure that capacity is used and paid for only by those who value the capacity at least as much as the cost of producing it. If prices are set at LRMC, airports can observe whether users are willing to pay for a capacity expansion, by observing the reaction of demand to a level of prices that reflects the cost attributable to the capacity expansion. Consequently, price signals are informative: airports will not invest where users are unwilling to pay the additional costs that such investment would create.

LRMC can be seen as a specific application of the long-run incremental cost (LRIC) concept, in which the increment is a single unit of output. Incremental costs are the increase in total costs following the introduction of an additional increment, which could be defined as an increment to the output or a new product or service. If a forward-looking cost is calculated assuming that all inputs are variable (as they are in the long run), the cost is referred to as a 'long-run incremental cost'.

When the future incremental costs at different points in time are averaged (which is one means of smoothing the price fluctuations that would otherwise result from a pure LRIC approach), the result is the long-run average incremental cost (LRAIC). The LRAIC may also be obtained by dividing the cost of the increment by the units of output with which it is associated. The measure of output is normally taken as throughput, although capacity could also be used.

2.2 Review of application of LRIC in other regulated sectors

The LRIC framework has been used most extensively in the telecommunications sector in the UK. Indeed, since 1997, BT's interconnection charges have been regulated using a LRIC-based price control, motivated by economic efficiency, provided that the underlying methodology is implemented in a robust manner.

By contrast, Ofgem does not use LRIC-based approaches to determine allowed revenues in the electricity distribution sector, although it does use LRIC as a means to distribute costs across the various functions of the network. Furthermore, in gas transmission, exit capacity

[2] In certain circumstances, the short-run marginal cost (SRMC) may be high due to the high cost of small, short-term additions to capacity.

[3] See, for example, Graaff, J. de V. (1967), *Theoretical Welfare Economics*, Cambridge University Press: Cambridge.

charges are set to reflect the LRIC of reinforcing the system to transport additional gas between entry and exit points.

In addition, LRIC is used in the regulation of water and sewerage companies as a reference point for companies and Ofwat in defining the changing structure within water price controls. Specifically, the volumetric element of two-part tariffs for metered water customers is based on LRMC estimates.

The LRIC framework might be viewed as an accurate way of measuring the costs of an efficient operator (depending on the current level of capacity utilisation), with the objective of promoting competition to derive the maximum benefit for all users in terms of price, choice and quality of service, and removing any distortions or restrictions on competition.

As such, the rationales from other sectors for adopting LRIC are reviewed according to the following criteria:

– efficiency;
– investment;
– entry;
– cost-reflectivity.

This high-level review indicates important considerations that might be relevant if a LRIC-based regime were to be implemented at Stansted. Subsequently, issues for consideration that have arisen in other regulated sectors where a LRIC framework has been adopted are examined.

2.2.1 Rationale behind the LRIC framework

The benefits of developing a LRIC-based approach have been highlighted most extensively by Ofcom:[4]

> Ideally, for economic efficiency, charges should be set in a way which encourages buyers to take account of the resource costs of their purchasing decisions … In a regulated environment, LRIC+ based charges are the ones that most accurately reflect the resources consumed by the provision of the services and, thus, correspond more closely to the charges that would occur in a competitive market. LRIC+ based charges also encourage efficient entry at the network level because they reflect replacement costs, which are the costs that would be faced by a new entrant.[5]

Indeed, when Ofcom changed its approach to regulating BT's interconnection charges from the basis of fully allocated costs to LRIC, this was because incremental cost pricing was preferred due to its incentives for economic efficiency, provided that the underlying methodology used to determine LRIC was robust.

The incentives under LRIC to promote allocative, productive and dynamic efficiency are examined below, based on evidence from other regulatory sectors.

Allocative efficiency

In economic theory, efficient allocation of resources occurs at the point where the price of a good or service is equal to the marginal cost of supplying it. In theory, as pricing at LRIC

[4] Ofcom uses LRIC+ to refer to long-run incremental cost plus an equi-proportionate mark-up to cover common costs.
[5] Ofcom (2004), 'Review of the Wholesale Local Access Network', December.

approximates the outcome from a competitive market, this rationale has been used by a number of regulators to motivate the introduction of the LRIC framework.

Indeed, in setting charges for access to the UK electricity transmission network, it has been stated that:

> efficient economic signals are provided to users when services are priced to reflect the incremental costs of supplying them. Therefore, charges should reflect the impact that users of the transmission system at different locations would have on the transmission owner's costs, if they were to increase or decrease their use of the respective systems.[6]

Ofwat (2001) used the following motivation for the use of pricing in water to reflect the marginal costs with respect to the effect of permanent changes in water consumption on a continuing basis:

> Customers' decisions to increase or reduce consumption will, over the long term, reflect their willingness to finance costs (or enjoy savings) associated with changes in consumption behaviour.[7]

Furthermore, regulators have promoted the LRIC approach on the basis that it promotes charges that reflect resource costs. Indeed, Oftel has promoted the use of LRIC on this basis:

> Forward-looking costs are the appropriate basis for interconnection charges because they reflect resource costs. Ideally for economic efficiency, the prices of retail services should be set in a way which encourages consumers to take account of the resource costs of their purchasing decisions.[8]

Productive efficiency

Productive efficiency implies the least-cost production of outputs. In the presence of sunk or fixed costs, productive efficiency is maximised where prices are equal to the lowest average cost (as opposed to marginal cost).

The requirement for firms to meet current demand at the lowest possible cost has been emphasised by a number of regulators. This is given as a rationale for the use of bottom-up LRIC models in particular, which reflect the efficient costs of a hypothetical network (see section 2.3.2 for further discussion). Indeed, the Australian Competition and Consumer Commission notes the benefits of LRIC in facilitating productive efficiency.

> An access price consistent with these principles will also promote productive efficiency. As the price will be based on the cost of providing the service using the most efficient means commercially available it will encourage access providers to continually improve their performance with the aim of achieving best practice and lowering cost.[9]

Investment and dynamic efficiency

Dynamic efficiency implies that firms invest in new fixed assets and innovation (R&D) at an optimal rate and point in time. This results in the optimal progression of productivity (ie, no network congestion) and quality enhancements such that welfare is maximised over time.

[6] National Grid (2008), 'Statement of the Use of System Charging Methodology', April 1st.

[7] Ofwat (2001), 'Report A: The Role of LRMC in the Provision and Regulation of Water Services', May 8th.

[8] Ofcom (1996), 'Pricing of Telecommunications Services from 1997: Controls and Consultative Document on BT Price Interconnection Charging—Annex D'.

[9] Australian Competition and Consumer Commission (1997), 'Access Pricing Principles—Telecommunications', July, p. 14.

The majority of regulators point to the incentives for efficient investment that arise from LRIC pricing. In the long term, LRIC pricing may promote the achievement of an efficient 'build-or-buy' decision. Over time, as firms invest and innovate, the industry should move towards long-run efficient production, although this requires a consideration of dynamic efficiency.

The use of LRIC methodologies to encourage entry has been a prominent motivation in the telecommunications sector in particular. This is consistent with the objectives of regulation: to replicate the effects of competition as much as possible. Indeed, allowing the most cost-efficient producers to enter and encouraging productive innovation are both necessary for dynamic efficiency. This is a view supported by several regulators—for example, Ofcom has stated that LRIC corresponds more closely to the charges that would prevail in an effectively competitive market than charges based on accounting-based measures of cost. Indeed, the US telecommunications regulator, the Federal Communications Commission (FCC), supports this rationale for the use of LRIC:

> Economists generally agree that prices based on forward looking long run incremental cost give appropriate signals to producers and consumers and ensure efficient entry and utilisation of the telecommunications infrastructure.[10]

Indeed, Ofcom has noted that LRIC:

> corresponds more closely to the charges that would prevail in an effectively competitive market than accounting-based measures of cost. It is a fundamental goal of price regulation to mimic the effects of a competitive market and this consideration underpins the use of LRIC.[11]

Furthermore, it is an established principle of regulatory economics and competition policy that LRIC pricing can also be used as part of a price floor, to avoid the potential for predatory pricing.[12] Indeed, Ofwat has stated that LRMC might provide an appropriate measure of avoidable costs since it should approximate savings made by a company in the event of not supplying an additional unit of water.[13] Hence, LRMC pricing may help to encourage entry and avoid predation.

Cost-reflectivity

The European Commission has advocated cost orientation as a broad principle for regulation, and has stipulated that LRIC is the appropriate measure to achieve this.[14] Several regulators have offered the rationale that LRIC models are sufficiently transparent for potential entrants to have confidence that the basis of charging is cost-oriented. Indeed, in setting out its approach, Ofgem states:

> One key consideration in terms of applying our statutory objectives … was that the UCAs [unit cost allowances] should be cost-reflective, given the latest available information. More specifically, the UCAs should reflect the efficient long-run incremental costs.[15]

[10] Federal Communications Commission (1996), 'Pricing Based on Economic Cost', p. 304. Available at http://www.fcc.gov/Bureaus/Common_Carrier/Orders/1996/fcc96325.

[11] Ofcom (2004), 'Statement on Wholesale Mobile Voice Call Termination', February.

[12] See, for example, Baumol, W. and Sidak, J.G. (1994), *Competition in Local Telephony*, MIT Press: Cambridge, MA.

[13] Ofwat (2000), 'Report A: The Role of LRMC in the Provision and Regulation of Water Services', MD170: Letter to Managing Directors', February 11th.

[14] See, for example, European Commission (1998), 'Commission Recommendation on interconnection in a liberalised telecommunications market (Part 1 Interconnection pricing)', 98/195/EC.

[15] Ofgem (2006), 'Determining Unit Cost Allowances (UCAs) for Large New Entry Points and Section 23 Notice for Fleetwood: Decision Paper', July 13th.

In water, the volumetric element of two-part tariffs for metered customers is based on LRMC estimates, although the link need not be 'mechanistic'. This link is required as it is 'considered to be consistent with a long term least cost approach to balancing supply and demand, and with companies duties to promote the efficient use of water by customers.'[16] For large-user tariffs, Ofwat requires that volumetric rates reflect LRMC 'as closely as possible', while if the regulator needs to determine the terms for bulk supplies, it has stated that LRMC 'will be a key reference point'.[17]

In the postal sector, one of the concerns of the Third Postal Directive is to ensure that costs are properly allocated between universal service obligation (USO) and non-USO services, but does not provide detail on how the cost-causation principle should be applied. However, it is generally considered that incremental costing techniques, such as LRIC, are consistent with the requirement for cost causation. As Larson (1998) notes:

> This principle [cost causation] is not formally defined in the economics literature, probably because the reasoning behind it is somewhat obvious: costs are recognized as being caused by the provision or expansion of a service if those costs are brought into existence as a direct result of the provision or expansion of that service, or if those costs would be avoided if the provision or expansion of that service were not undertaken.[18]

All of the above suggests that, from the economic theory perspective, LRIC provides appropriate incentives and ensures economic efficiency.

[16] Ofwat (2000), 'Report A: The Role of LRMC in the Provision and Regulation of Water Services', MD170: Letter to Managing Directors', February 11th.
[17] Ofwat (2000), 'Report A: The Role of LRMC in the Provision and Regulation of Water Services', MD170: Letter to Managing Directors', February 11th.
[18] Larson, A. (1998), 'Pricing Principles in Telecommunications', in W. Sapronov and W. Read (eds), *Telecommunications: Law, Regulation and Policy*, Westwood: Greenwood Press.

3 Advantages and disadvantages of moving to LRAIC at Stansted

This section sets out the possible public interest advantages and disadvantages of a move to LRAIC-based charging at Stansted, evaluated against, and contrasted with, the rationales for the use of LRAIC that have been put forward in other sectors.

It summarises the potential consequences of applying LRAIC at Stansted in relation to the specific context of that airport, taking into account the rationales and challenges of LRAIC deployment observed in other sectors, and the CAA's arguments in support of LRAIC.

3.1 Arguments in support of LRAIC at Stansted

The CAA has emphasised that any price cap at Stansted should reflect the circumstances of the airport, and it is in this context that it has proposed a price control based on measures of forward-looking costs. Consequently, it is argued that LRAIC may serve as a reasonable proxy for prices in a competitive market.

LRAIC is central to the proposals for the regulatory options based on the market-led price cap (MLPC) and the precautionary price cap (PPC). The MPLC may be based on LRAIC, but allows for differences between LRAIC and the actual (short-run) price. The PPC could also be based on LRAIC, but allowing a margin above the LRAIC such that the resulting PPC is just below the level that competition authorities may consider 'abusive'. By definition, the PPC would be set at a level above the MLPC.

In both cases, LRAIC is intended to achieve two primary objectives.

- In markets requiring investment in capacity, prices are likely to reflect the forward-looking LRIC of investment. The LRAIC is one such measure, providing an estimate of the time-averaged cost of investment in new capacity:

  > In principle, therefore, there is a strong case for considering price control approaches that seek to reflect cost measures such as LRAIC, as a reasonable proxy for the level of prices that would be expected in a well-functioning airport market. The case is even stronger where a price cap is applied to a market where there is current and/or prospective competition.[19]

- The second objective of LRAIC is to reduce the need for the regulator to make decisions on the timing and specification of major investment projects (subject to the details of the regulatory regime). Therefore, it might be perceived that the CAA's overall rationale in deploying LRAIC at Stansted is to change how investment is incentivised: LRAIC price signals indicate whether investment is justified by reference to whether the LRAIC price reflecting the cost of that investment can be borne by airport users.

The CAA's response to the 'Issues Statement' on Stansted also raises the question of whether there is a strong case for LRAIC-based approaches *in practice*. In other words, the

[19] CAA (2008), 'The Competition Commission's Quinquennial Review of Stansted: The Civil Aviation Authority's response to the Issues Statement', June.

'detail' of the proposal matters. This point is critical since practical difficulties in implementation may outweigh theoretical merits, as Kahn (1970) states:[20]

> Principle must be compromised in various ways in the interests of practicality

The public interest implications of LRAIC must therefore be assessed in light of the practical details of any implementation, as well as the impact of the potential introduction of LRAIC on incentives to invest, including the impact on the risks and returns of investment, as discussed below.

3.2 Impact on incentives to invest: comparison with other sectors

This section evaluates the potential impact of the introduction of LRAIC at Stansted on incentives to invest in comparison with both the application of LRAIC methodologies in other sectors and the RAB/WACC building-block approach, taking into account Stansted's specific circumstances and characteristics.

3.2.1 Valuation basis, technological change and the use of MEA

An important motivation for LRIC methodologies, especially in the telecommunications sector, is the desire to encourage efficient entry (reflected in the use of MEA as the basis for valuation of the replacement cost of the relevant network). In an environment of rapid technological change, the use of historical costs as a basis for pricing could lead to a significant misallocation of resources.

LRIC methodologies might be seen as sending efficient 'make-or-buy' signals, indicating whether competitors should pay to access the incumbent's network or to develop their own. It is important to examine to what extent these considerations are relevant to the circumstances prevailing at Stansted.

In practice, the difference between the replacement costs and efficiently incurred historical costs at Stansted is likely to be modest, as the CAA notes in its response to the Issues Statement.[21] It is also likely to be modest in relation to the differences between these measures in, for example, the telecommunications industry. For this reason, the advantages rendered by a LRAIC approach might be relatively small in the airports sector compared with industries characterised by rapid technological change.

In other words, the 'entry' signals (which may be interpreted as decisions to expand competing airports such as Luton) will not be impaired to a significant degree if LRAIC is not used.

On the other hand, because of the slower pace of technological development, the size of the economic loss to the firm that would otherwise arise under LRAIC (due to the failure to fully recover costs) is lower than in industries such as telecommunications. With more rapid technological growth, incumbents' actual networks might be persistently less efficient and more expensive than the hypothetical networks that determine prices for entrants and other competitors of the incumbent, which means that LRIC-type methodologies impose economic losses on incumbents. This suggests that, compared with other sectors, incentives to invest may not necessarily be significantly strengthened under LRAIC using MEA as a valuation basis, compared with a RAB/WACC approach based on the standard periodic review of historically incurred costs.

[20] Kahn, A. (1970), *The Economics of Regulation: Principles and Institutions*, John Wiley and Sons: New York.

[21] CAA (2008), 'The Competition Commission's Quinquennial Review of Stansted: The Civil Aviation Authority's Response to the Issues Statement', June.

3.2.2 Updating and regulatory commitment

Regulators cannot commit beyond the forthcoming control period: the use of LRAIC in Q5 does not rule out the use of RAB/WACC in future regulatory settlements, and vice versa. Although this lack of commitment is a recognised part of the regulatory environment in which Stansted operates, and its implications for long-term investment are understood, there appears to be a particular risk that efficient investment may become stranded if already commenced, given the possibility of 're-regulation', which is as follows.

LRAIC is intended to deliver long-term signals, and may lead to higher prices than a RAB/WACC approach, providing an indication that investment could be undertaken efficiently. Assets constructed based on LRAIC signals then face the risk of becoming stranded if the future regulatory settlements use RAB/WACC that results in lower prices which may not fund partially completed assets. This depends on the extent to which the prices under the two approaches would actually differ in practice, as discussed below.

The issue of updating is arguably more severe in airports than in other sectors such as post and telecommunications. In these sectors, the products and services that are priced on LRAIC are shorter-lived than, for example, a runway or terminal investment. In addition, the actual *network* itself to which those products and services are incremental has an economic life that is likely to be shorter than the useful life of a runway. Therefore, it seems reasonable to conclude that the updating problems are more pronounced in airports than in certain other regulated sectors.

A related concern is as follows: if the LRAIC were to be re-set at the start of each price control, this would require re-valuing the assets at their replacement cost, based on the MEA values. Potentially, this might introduce the possibility that the price cap could fluctuate between price controls. This could lead to a risk that historical investment might not be reflected in future prices, as investment triggered by a high price cap might then become non-profitable if the price cap were to be reduced in the following regulatory period. This possibility was noted in the Europe Economics paper, and in the CAA's reference to the Competition Commission, where it stated that:

> In the CAA's view, when using LRAIC to inform the setting of the level of the price cap it is important to ensure that the estimate used does not vary significantly over time and, in particular, does not artificially depress airport charges following a major investment, as to do so might discourage economic and efficient investment.[22]

Since the CAA cannot commit to maintaining the LRAIC at a particular level, and since, in any event, doing so would appear contrary to the underlying rationale of LRAIC, the important detail on how LRAIC would actually be updated in practice remains unresolved.

3.2.3 Operational constraints and investment signals

A criticism levied in telecommunications and other sectors is that LRAIC-type methodologies assume that networks and the level of investment can be instantly and completely reconstructed with the best available technology.

Indeed, the CC's Q4 report argues that the theoretical case supporting the desirability of LRIC pricing should be considered in the context of insufficient capital investment

[22] CAA (2008), 'Airport Regulation Price control review—CAA reference to the Competition Commission for Stansted Airport' April.

flexibility at the airport level, making particular reference to the circumstances of Heathrow.[23]

The CC argued that, taking planning, operational and other constraints as given, the (constrained) optimum level of investment could be largely, if not completely, achieved and financed at prices below LRIC, but without precluding the possibility that LRIC would bring forth some additional projects. Crucially, the Commission concludes that the higher charges resulting from LRIC pricing would not increase investment at Heathrow sufficiently to justify the charges. It also notes that proper application of LRIC would result in charges rising only as and when incremental passengers used the new facilities, which would mean that the charge increases in the case of T5 would be shifted to Q5, to which credible commitments could not be made in Q4.

It is reasonable to conclude that the operational and other constraints are more severe at Heathrow than at Stansted, given the characteristics of the two airports. The CAA's proposals may therefore mean that more projects are called forth at Stansted by the signalling provided by the LRAIC than would be the case under RAB, subject to the qualification that Stansted would face no obligation to invest even where LRAIC 'uncovers' potential investments. Nevertheless, these types of constraint are an inherent feature of the airports market, and it would be worth establishing exactly which constraints will be considered relevant for Stansted before imposing an LRAIC-based control.

3.2.4 Obligation to invest under LRAIC

It could be assumed that Stansted would face no obligation to invest under LRAIC. The CAA's proposals might, if they operate as intended, give Stansted a *signal* to invest, but it remains at the airport's discretion as to whether it chooses to proceed with any investment, even if such an investment could be profitable and in the interests of airport users.

Stansted may wish to refrain from investment, despite the indications from the LRAIC price that investment is justified, if it considers the volume, construction, regulatory, funding and other risks associated with a major CAPEX programme to outweigh the advantages of charging a possibly high LRAIC at a congested airport. In other sectors that face some form of LRIC pricing, such as post and telecommunications, these operators do not face the same demand risk as an airport contemplating the construction of a runway and associated facilities when a new product or service is introduced. They also generally charge LRIC-based prices for products and services that do not approach 100% of existing RAB, as would be the case for a runway and associated terminal development at Stansted.

3.2.5 Price volatility

The CAA has argued that LRAIC prices are not intended to reflect the short-term balance between supply and demand, which, as noted, increases demand risk. This might be particularly significant at Stansted, given the sensitivity of revenues to external market shocks, such as the impact of September 11th. There is clear evidence that Stansted's financial position was affected more as a result of the terrorist attacks than either Gatwick or Heathrow.[24]

The CAA has emphasised that LRAIC may be an appropriate methodology because it reflects the competitive environment in which Stansted operates, in which case it may be worth considering that the LRAIC, by definition, would represent a constant price per passenger and would be assumed to be constant over the duration of the price control. In

[23] Competition Commission (2002), 'A Report on the Economic Regulation of the London Airports Companies (Heathrow Airport Ltd, Gatwick Airport Ltd and Stansted Airport Ltd)', October.
[24] Competition Commission (2007), 'Cost of Capital', Appendix F, F28.

industries such as transport, where demand fluctuates in response to global market conditions, uniform fixed-cost-based price ceilings (or floors) may not capture the changing demand conditions.

3.2.6 Consistency in charging across airports

If Stansted were to be regulated under a different regime to Heathrow and Gatwick, it would be important to consider the impact this might have on investment incentives across the airports. This suggests that if consumers (both passengers and airlines) are to make decisions that efficiently reflect resource and opportunity costs, airports may need to use common standards and employ equivalent methodologies for charging. If RAB/WACC charges at Heathrow and Gatwick are below the competitive level then Stansted will perversely attract too much investment if a high (relative to charges at the other regulated airports) and binding LRAIC price is obtained.

3.3 Impact on incentives to invest: comparison with RAB/WACC

A move from a RAB/WACC approach to LRAIC at Stansted would imply a significant change in the regulatory regime at Stansted, and in particular the risk/return it faces when evaluating investment decisions. Although both the LRAIC and RAB/WACC regimes are flexible, in the sense that the regimes' design parameters might be tailored to suit specific policy objectives and prevailing market conditions, there are some key differences.

– **RAB/WACC approach**—this typically represents a generic utility model based on the ability of regulated firms to recover all costs associated with efficiently incurred operating expenditure, plus depreciation on the RAB, as well as a return on the RAB. The last two elements provide for a return *of* capital and a return *on* capital, respectively.

– **LRAIC approach**—a forward-looking, cost-based model of regulation. In a pure sense, LRAIC represents the additional cost of supplying an increment to demand in the long run, when all costs, including capital costs, are assumed to be variable.

A number of details surrounding the implementation of LRAIC at Stansted are not yet known. Indeed, the CC has recently acknowledged that:

> Given that a LRAIC approach would be a completely new framework for airport price controls, we are aware that there is likely to be considerable disagreement on the detailed structure of the price control, how to estimate the relevant components, and how to transition appropriately from a regulatory asset base approach to a LRAIC based approach.[25]

This section outlines potential issues to consider when moving from RAB/WACC to LRAIC. This assessment follows a number of criteria for assessing the merits of the regulatory options recently proposed by the CC, including the impact on incentives faced by the airport operator.[26]

3.3.1 Efficient investment signals

To the extent that the LRAIC reflects the forward-looking long-run incremental cost of supplying new capacity, the signals provided for investment might be more efficient than under the RAB/WACC framework. Under the LRAIC framework, the airport operator might have greater flexibility over the timing and specification of major investments.

[25] Competition Commission (2008), 'Inquiry into Airport Charges at Stansted Airport: Issues Statement, May, p. 12.
[26] Ibid., p. 13.

In contrast, the RAB/WACC model is often charged with providing conflicting signals in relation to investment incentives. On the one hand, regulated companies may suggest that a regulatory framework based on strong ex ante (efficiency) incentives discourages investment because it rewards reductions in costs (including investment costs). On the other hand, a regime without substantial efficiency incentives may give a ‘cost plus’ aspect to the regulatory regime, which could more substantially encourage investment. The extent of the incentives for efficiency or investment under the RAB/WACC framework will depend on the level of the allowed rate of return and the actual cost of capital. Indeed, the current precedent of allowing the airport operator to earn a full return on assets in the course of construction may provide greater incentives to undertake large CAPEX projects than under the LRAIC regime, to this extent.

3.3.2 Timing delays and the investment horizon

The impact of any timing delays on incentives to invest needs to be examined. Under the RAB mechanism, as prices are capped for the control period, there will be some lag between incurring CAPEX and this being remunerated. This timing effect could give rise to an incentive to underspend on CAPEX relative to the expectations at the outset of the regulatory period, although, on the other hand, the incentive to ‘gold-plate’ would remain to some degree.

However, this would also need to be considered in relation to the investment incentives in the LRAIC models, where the problem of delays might be exacerbated if the LRAIC causes the investment horizon to be shortened.

3.3.3 Remuneration of past investment

As well as providing appropriate incentives for new investment, previous levels of investment would still need to be remunerated. Under the LRAIC approach, the price cap would not reflect investment that has taken place historically. Instead, the LRAIC would be calculated on the basis of assets that are currently in place, instead of the value of the assets that were efficiently incurred at the time of construction (as reflected in the current RAB/WACC regime). Potentially, this might expose an airport operator to additional risks associated with unexpected changes in demand or the business model of the airlines, with the potential for undermining investments. This risk might be compounded at Stansted, given the leading positions of Ryanair and easyJet at the airport.

In contrast, under the RAB/WACC regime, previously invested capital would be recovered through the ‘depreciation’ component of allowed revenues. Although the potential for asset stranding might be unavoidable if there were to be a move to an LRAIC-based approach, it would be important that the potential risk is evaluated thoroughly.

As such, it would be important to ensure sufficient cost recovery under the LRAIC framework. As RAB-derived prices are ‘average’ costs associated with delivering specified volumes, not marginal or incremental costs, the RAB explicitly reflects the recovery of investments that have been made historically. Cost recovery is therefore arguably more reliably achieved with a RAB/WACC model (although this will depend on whether any mark-ups are applied in the LRIC model).

This does not necessarily mean that the RAB/WACC model is invariably superior, since this will depend on the policy trade-offs implicit in achieving allocative, productive or dynamic efficiency. Instead, the LRAIC might be thought of as a floor for pricing purposes, rather than a level at which charges should be set.

This suggests that due consideration will need to be given to ensure that the operator faces appropriate incentives to invest. In contrast, in other sectors that face some aspect of LRMC pricing (eg, telecommunications and post), incumbent operators arguably do not face the same uncertainty around demand as an airport contemplating the construction of a runway and associated facilities, over the lifetime of the investment. In other words, they may face significant demand risk in the short term, but would expect a return on their investment over a period significantly shorter than the investment in an airport.

Furthermore, if characteristics of new investments were significantly different from previous investments then the LRAIC may result in a higher price than would be obtained under a RAB/WACC approach to capping charges. This is because that airports will be developed in such a way as to exploit efficient low-cost development in the first instance, so that the average cost is increasing over time with the result that the LRAIC will also be increasing over time. On the other hand, since RAB/WACC directly remunerates past investment as well as the anticipated costs of future CAPEX, the price will not necessarily be higher under the LRAIC approach.

3.3.4 Discount rate

It would also be important to ensure that the discount rate does not become disassociated from the required rate of return. Under the LRAIC approach, the discount rate would reflect a long-term view of the cost of capital for a generic airport asset. This potentially creates a risk that the discount rate would become disassociated from the required rate of return. As such, under the LRAIC framework, it would be important to ensure that the cost of capital is seen as an upper bound.

3.3.5 Asset transparency and funding

The RAB is an established part of the existing regulatory regime for airports in the UK, and is well understood by investors and other stakeholders. Investors often use the RAB as the starting point in their valuation analysis, and the RAB valuation methodology used by the regulators in determining maximum allowed charges in regulatory settlements can be easily mapped onto cash flows.

Moreover, investors perceive the RAB/WACC mechanism as a reference point for the analysis of risk and returns on regulated businesses over the long term, as well as a form of risk mitigation with respect to asset stranding. RAB also facilitates debt origination.

A change away from RAB/WACC regulation might have significant consequences for the availability of funding, particularly debt funding. This is because debt investors might attach limited importance to any potential upside over and above the price cap as determined by RAB/WACC regulation, but, at the same time, could discount any collateral that is not explicitly linked to the RAB. This might be an important consideration in light of the potential change in the regulatory regime.

Adoption of LRIC might also restrict the duration of debt and different types of financial structure available to the company. This might be particularly important at a time of ongoing financial turmoil, given the fact that it might be perceived as an additional uncertainty factor, but it is difficult to comment on whether it would represent a permanent effect. Debt and equity investors in BAA may also perceive that asset transparency is impaired in moving from RAB/WACC to LRAIC.

All these factors might affect the availability of long-term funding for Stansted under LRAIC or the cost of funding, or both.

4 Conclusion

LRAIC methodologies have a strong theoretical foundation, and are used in a number of sectors for a variety of reasons, including to provide incentives for investment and for entry, to ensure cross-reflective pricing, to avoid cross-subsidisation from regulated to non-regulated sectors, and to prevent discrimination.

It does not automatically follow that all these considerations are actually of relevance to the specific circumstances of Stansted Airport. Therefore, it is important to consider the rationale for proposing LRAIC—for example, to deliver incentives for investment that reflect the competitive environment in which the airport operates.

The situation of Stansted presents a number of challenges and differences to the application of LRAIC in other sectors, even where attention is restricted to sectors that have sought to encourage investment.

In particular, investment can be encouraged through the implementation of LRAIC by giving efficient ‘buy-or-build’ signals to potential entrants. Competing airports cannot ‘buy’ access to Stansted’s service, but do receive information from the ‘build’ signal (which might indicate that capacity at competing airports could be profitably expanded). In addition, entry and investment are encouraged in other sectors through the implementation of LRAIC because of technological change, since not using MEA pricing could lead to misallocation of resources.

The extent to which this is relevant at Stansted might be seen as an empirical issue, but the comparable pace of technological change in airports is different to that in other industries. Furthermore, the economic life of airport capacity assets is longer than the products and potentially also the networks of other sectors. This has implications for the updating of the LRAIC (with implications for stranding and regulatory risk) and the absence of an obligation for Stansted to invest.

Other differences with the use of LRAIC in other sectors compared with Stansted include Stansted’s presence in a system of regulated airports (none of which is currently regulated on the basis of LRAIC). Additionally, the problem of regulatory commitment in the context of Stansted’s capacity investment requirements is arguably more severe than in sectors with shorter economic asset lives.

This should not be seen as questioning the potential advantages of LRAIC in general, but as recognising that LRAIC might significantly alter the investment horizon, incentives and risks that Stansted faces relative to those that would prevail under a RAB/WACC approach. Consequently, the details of any implementation of a LRAIC proposal are critical, and should be addressed before this type of analysis is introduced to regulate charges at Stansted during Q5.

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