

Scarcity rents and airport charges



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Scarcity rents and airport charges

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Table of contents

1	Scarcity rents and airport charges.....	1
1.1	Background.....	1
1.2	Scarcity rents	1
1.3	Do airlines benefit from scarcity rents?.....	3
1.4	Pass-through of higher airport charges.....	8

1 Scarcity rents and airport charges

1.1 Background

The Airports commission requested the ITF/SEO to offer technical assistance with analysing technical responses submitted by stakeholders during the consultation process that pertain to the previous work undertaken by the ITF/SEO.

This report addresses the responses related to scarcity rents and airport charges. The Commission has asked ITF/SEO to provide evidence on scarcity rents in the London airport system. Different reports submitted in response to the Commission's consultation make different assumptions on the way airlines either absorb or pass through aero-charges and whether or not airlines benefit from scarcity rents at an airport. The arguments comprised in submissions to the Commission relating to scarcity will be assessed objectively using economic theory. This will help the Commission to give validity or invalidate the arguments put forward on scarcity rents and their potential impact on the estimated results.

1.2 Scarcity rents

Gatwick and Heathrow are operating at or near capacity, either operational capacity or declared capacity, particularly during peak periods. In these circumstances, prices would be used to balance the level of demand with the capacity available. If the airport prices efficiently through its aero-charges, scarcity will be reflected in higher (peak period) charges, hence in higher costs to the airlines and, in turn, in higher fares charged to passengers for travel at peak periods.

But for various reasons congested airports often charge airlines inefficiently low prices. Starkie (2004)¹ states in relation to Heathrow that the airport operator "is prevented by the regulatory price cap from charging market-clearing prices at Heathrow and capturing the scarcity rents associated with its capacity constraints".

The sensible airline will maintain its fares at market clearing levels where airport charges are capped at a level below the market clearing rate. This will result in high fare yields. In other words, airlines will charge what the market can bear and will make excess profits on the use of scarce slots (Starkie 1998)². It does not make sense for the airlines to pass on sub-optimally low airport charges in the form of lower fares for passengers. If they were to do so, service quality would deteriorate. Specifically, a growing number of frustrated customers would be unable to

¹ Starkie, D. (2004). Testing the regulatory model: the expansion of Stansted Airport. *Fiscal Studies* 25(4), 389-413.

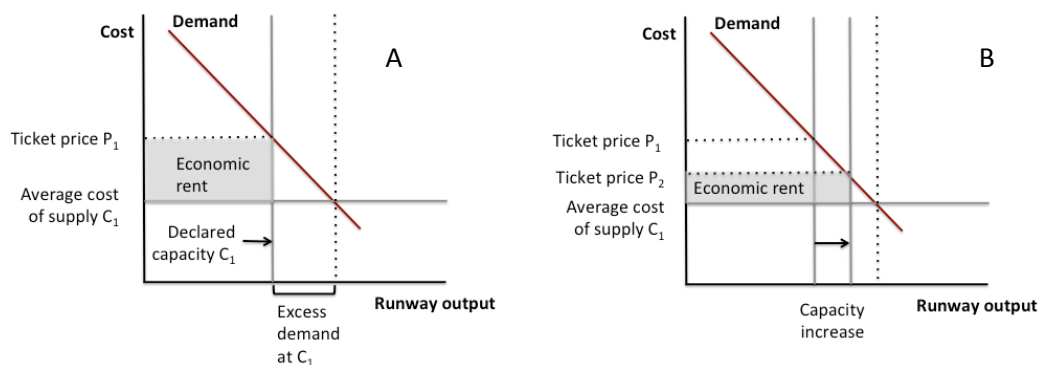
² Starkie, D. (1998). Allocating airport slots: a role for the market? *Journal of Air Transport Management* 4, 111-116.

obtain a booking at posted prices (Starkie 1998)³. So airlines have no incentive to compete the low airport costs away (Forsyth 2004)⁴.

The impact of airport expansion on scarcity rents

From economic theory it follows that in sufficiently competitive markets, airport expansion will reduce airline scarcity rents (see figure 1.1), reflected in lower airfares and lower airline revenues than would otherwise arise. When capacity is added to either Heathrow or Gatwick, new airlines will enter the market and add new routes (as under the slot allocation rules in place at least 50% of slots have to be allocated to new entrants). Because of the increased contestability of the market, ticket prices will fall, reducing the economic rent for the airlines to the benefit of the consumer. Benefits in terms of ticket prices are likely to be highest when capacity is expanded at the airport with the largest excess demand.

Figure 1.1 Reduction of excess demand decreases ticket prices/ airline scarcity rents



Source: ITF/SEO (2014)

The ITF/SEO study⁵ for the Airports Commission argues that airlines at Gatwick and in particular at Heathrow generate scarcity rents due to the excess demand and the price capping of charges. Furthermore, the study shows that these scarcity rents will further increase in the future in a ‘do minimum scenario’ because excess demand increases further as demand grows but no additional airport capacity becomes available. The study assumes that any increases in aero-charges will be absorbed by the airlines through a reduction of airline scarcity rents.

The issue

The issue that follows from the stakeholder submissions in relation to scarcity rents essentially boils down to two questions: (1) to what extent do airlines benefit from scarcity rents at Gatwick and Heathrow? And (2) will airlines absorb or pass-through increases in aero-charges? We will discuss both questions, using the available literature and the relevant submission documents.

³ Starkie, D. (1998). Allocating airport slots: a role for the market? *Journal of Air Transport Management* 4, 111-116.

⁴ Forsyth, P. (2004). Locational rents at airports: creating them and shifting them. *Journal of Air Transport Management* 10, 51-60.

⁵ ITF (2014). Impacts of expanding airport capacity on competition and connectivity: the case of Gatwick and Heathrow. Report prepared for the Airports Commission, December 2014. <http://www.internationaltransportforum.org/Pub/pdf/14Impacts-Airport-Capacity.pdf>

1.3 Do airlines benefit from scarcity rents?

Evidence on the existence of scarcity rents

We conclude from the submissions and the literature that the views, assumptions and findings on the existence of scarcity rents are mixed. The existence of scarcity rents, in particular at Heathrow, is supported by a number of published reports:

- The CAA (2005)⁶ has argued that airlines operating out of Heathrow in particular gain a significant scarcity rent. It undertook research that showed that revenues from flights to a number of destinations from Heathrow greatly exceeded those from similar flights from Gatwick. It estimated, for example, that a BA short-haul flight operating out of Gatwick would show an additional profit of £2 million per year at Heathrow. According to Starkie (2006)⁷, this difference, referred to as the Heathrow premium, does not take account of the higher operating costs experienced at Heathrow; therefore the net premium is likely to be less but probably remains substantial.
- Frontier Economics⁸, using extensive econometric analysis, estimates a significant scarcity rent/shadow cost for Heathrow ('the Heathrow premium'). The congestion premium at Heathrow today is around 15% or £95 for an average return trip compared to 7% or £20 for a return trip at Gatwick after accounting for the average difference in airport charges (Frontier Economics 2014, p. 47).
- The Airports Commission assumes the existence of scarcity rents (shadow costs) and follows a similar line of reasoning in its economic efficiency analysis to ITF/SEO⁹. However, unlike ITF/SEO the Airports Commission does not necessarily assume that rents accrue to airlines. In the estimation of welfare benefits they are assumed to go to producers, which could be airlines but could equally be the airport.

In contrast, SLG¹⁰ concludes in a report for the CAA that because airline costs and fares have fallen in the last 10 years in real terms, while there has been strong growth in GDP, this suggests that airlines have not been able to capture much of the potential economic rent associated with growing demand. Instead, competitive pressure has led to cost reductions being passed through to consumers as lower fares. We note that –as far as we are aware– that SLG does not refer to evidence on scarcity rents based on econometric analysis. In addition, SLG states that the supply curve in figure 1.1 may actually not be vertical but upward sloping. Although airport capacity is fully constrained, airline capacity may not. Airlines still have the opportunity to increase load factors and use larger aircraft. This could imply that the excess passenger demand is more limited or at least smaller than the excess demand for airport slots.

⁶ CAA (2005). Airport regulation: price control review e consultation on policy issues. Cited by Starkie (2006).

⁷ Starkie, D. (2006). Investment incentives and airport regulation. *Utilities Policy* 14, 262-265.

⁸ Frontier Economics (2014). Impact of airport expansion options on competition and choice. A report prepared for Heathrow Airport Ltd, April 2014.

⁹ Airports Commission (2014). Economy: transport economic efficiency impacts. November 2014.

¹⁰ SLG (2013). Q6 review of the distribution of economic rent between airport, airlines and passengers and cargo users at Heathrow and Gatwick. A report prepared for the CAA by SLG Economics Ltd.

The BA submission/ CEPA submissions by BA

In its main submission BA disputes both the Commission's and HAL's statements that airlines at Heathrow benefit from substantial scarcity rents (BA 2015)¹¹. Already in 2004, Starkie (2004)¹² reported that BA argues that the airline scarcity rent/ fare premium does not exist. "It points out that if such a premium did exist, it would be reflected in excess profits and return on capital, which BA does not experience". BA's recent submission (CEPA 2015, p.3)¹³ underlines this view, by commenting on both the ITF/SEO and the Frontier Economics reports: "The chosen assumptions and simplifications mean that scarcity rents are overestimated in both studies, possibly by a large margin. Clearly, estimation of scarcity rents in the airline market is a very difficult undertaking due to its complex commercial constraints and interactions."

A number of comments have been raised in the CEPA report with respect to the calculated scarcity rents. Among the many detailed comments, the report of CEPA can be brought back to the argument that scarcity rents in both the Frontier Economics and ITF/SEO study are overestimated because:

- Assumptions on price elasticities are crucial but the evidence as to what elasticities should be assumed is ambiguous. Various sources cite elasticities that differ from those used by Frontier and ITF/SEO. Elasticities differ by market segment, so the use of aggregate elasticities always leads to simplification and possibly bias in the model results. Furthermore, elasticities may change over time but are considered constant by ITF and SEO.
- Scarcity rents are assumed to be retained by the airlines even though they do not show up as profits in their accounts and could accumulate elsewhere in the airport value chain. "Other providers in the value chain, such as the airport itself or baggage handling and catering companies at the airport, could claim a share of the rents through their charges to the airlines". In addition, the ability to realise rents is limited because of the necessity in the network carrier business model to achieve a balanced portfolio of flights coupled with competition at the margin.
- Ticket pricing and capacity allocation by airlines is complex and far from homogeneous. Collectively airlines may be able to extract scarcity rents, but individually the airline's pricing strategy is constrained. Many factors determine the ticket price and various factors constrain the individual airline's pricing decisions. For example, although airport capacity as a whole may be constrained, on particular 'popular' routes, excess supply of seats and flights may very well exist. Other constraints to benefit from scarcity rents could include the commercial necessity to maintain certain price differentials between bookings classes. Hence, "an individual airline's ability to extract rents (as opposed to the industry collectively) depends crucially on market segmentation. This segmentation includes long-haul, short-haul, business, leisure, point-to-point and transfer, low-cost and full service, booking classes, and the capacity on individual routes".

¹¹ BA (2015). British Airways response to the Airports Commission Public Consultation on new runway capacity in the South East

¹² Starkie, D. (2004). Testing the regulatory model: the expansion of Stansted Airport. *Fiscal Studies* 25(4), 389-413.

¹³ CEPA (2015). Airport extensions and scarcity. Discussion of recent studies. Briefing note prepared for British Airways, February 2015.

Review of CEPA comments

The view of BA should at least be nuanced. According to Starkie (2004)¹⁴, “it is difficult to accept, in the light of the CAA evidence and more particularly in view of BA’s willingness to pay other airlines operating at Heathrow considerable sums for an exchange of their slots, that there is no Heathrow premium. A fares premium at Heathrow and the absence of excess profits for BA can be reconciled by the fact that BA has an extensive network of routes, not only at Heathrow but also out of Gatwick and other regional centers such as Birmingham, Manchester and Glasgow. On the fringes of these networks, BA probably faces strong competition; some services will be marginal and others might well operate at a short-term loss, albeit with the prospect of more profitable operations in the future. Other routes might be marginal even if competition is absent because of low levels of demand. It is possible, therefore, that BA uses rents from Heathrow to sustain a larger network and a greater service frequency (particularly to feed traffic to long-haul services) than it would otherwise do in the absence of those rents”. In addition, -as CEPA also states- the scarcity rents may translate into higher profits for airlines but also in other expenses. This could be due to for example, high labour costs as a consequence of strong unions.

The CEPA conclusion that rents may also accrue elsewhere in the airport chain may be valid. This means that additional trip costs may also arise in airport charges, airport parking, airport transportation and other services to passengers. However, as far as we know, there is no empirical evidence on the distribution of those rents in the value chain. Wherever rents end up, in terms of negative consumer welfare impacts, scarcity of airport capacity will still be reflected in higher costs for the consumer (which will further increase in the future).

CEPA correctly states that price elasticities in practice differ by individual market (segment). In addition, assumptions on price elasticities have a substantial impact on the results. The ITF/SEO elasticities have been derived from the existing literature and own analysis. A conservative cross-price elasticity of -3 for the transfer market has been chosen and an elasticity of -1 for the OD market. In individual markets and passenger segments, there is a wide range of elasticities. This is something to be taken into account when interpreting the results. At the same time, making assumptions on the elasticities is inherent to long-term scenario/forecasting analysis as carried out in both the Frontier and ITF/SEO studies, and also to the scenarios of the Airports Commission itself. This implies a certain generalization over different markets.

Frontier Economics on scarcity rents. Submission by Heathrow Airport Ltd.

Frontier Economics (2015)¹⁵ acknowledges the existence of scarcity rents (shadow costs), but comments on the methodology used for calculating scarcity rents in the Airports Commission scenarios. As ITF/SEO uses the Airports Commission’s scenarios, the comments are relevant to the ITF/SEO study as well. The main comments can be summarized as follows:

- The Airports Commission scenarios underestimate the scarcity rents for Heathrow as the base year in which Heathrow was still unconstrained is in fact much earlier than assumed by the Airports Commission. This means that the scarcity rents are in fact higher than produced in the Airports Commission’s approach (and thus in the ITF/SEO approach).

¹⁴ Starkie, D. (2004). Testing the regulatory model: the expansion of Stansted Airport. *Fiscal Studies* 25(4), 389-413.

¹⁵ Frontier Economics (2015). The cost savings to UK businesses from a Heathrow expansion. A report prepared for Heathrow Airport. January 2014.

- Substantial scarcity rents are present in long-haul markets but not in short-haul, where competitive conditions are different.
- Overall scarcity rents per passenger are higher at Heathrow than at Gatwick. This is because price elasticity is higher at Gatwick than at Heathrow. Secondly, the absolute ticket price at Gatwick is lower than at Heathrow, because of network characteristics (fewer long-haul flights). “This implies that even if there was the same level of excess demand and with the same price elasticity, the absolute price increase required to balance demand and supply would be lower”.
- Substantial scarcity rents are present in long-haul markets but not in short-haul, where competitive conditions are different.
- According to Frontier, there is little basis for making a crowding out assumption for transfer traffic. Since 2000, Frontier estimates that growth in underlying demand could have added up to 10mppa to O/D traffic. Any trend towards O/D traffic driving out transfer could therefore have had a very significant impact on the proportion of transfer traffic at Heathrow, but it did not.

Review of Frontier Economic’s comments

As far as the base year in which Heathrow and Gatwick are capacity unconstrained is concerned, Frontier may have a relevant point, as this indeed influences the amount of the scarcity rents, which would be higher in particular for Heathrow. The ITF/SEO study works with the same unconstrained base year as the Airports Commission, so this observation is relevant to the ITF/SEO study as well.

In relation to price elasticities, Frontier’s comment resembles the one of CEPA. Elasticities differ by individual route. For both the Airports Commission and the ITF/SEO scenarios, Frontier makes a valid point that long-haul elasticities are lower than short-haul elasticities. In addition, we note that the average elasticities used by Frontier and ITF/SEO in the OD market are on average higher than the elasticities those used by DfT. They are in line with the elasticities presented by IATA, Gillen and InterVISTAS, but higher than used in the DfT-models. For the transfer market, ITF/SEO uses a cross-price elasticity of -3, which is assumed to be quite conservative, as transfer passengers tend to be very price sensitive and footloose. A small price increase will result in many passengers substituting a London transfer airport for another direct or indirect travel alternative. This number is considerably higher than the elasticity used in the DfT forecasting model (-1). We do think there is convincing evidence for the higher elasticity in the transfer market. Frontier, on the other hand, does not seem to distinguish between elasticities in the OD and transfer market.

In sum, there is a wide range in price elasticities between various markets in practice and there is uncertainty regarding the ‘correct’ elasticity to use, as CEPA correctly mentions. At the same time, the elasticities are important drivers of the scarcity rent results in the Airports Commission/DfT modeling work, the ITF/SEO study and the Frontier study. This calls at least for a careful interpretation of these results and preferably a sensitivity analysis.

As far as the crowding out effect is concerned, we note that various factors need to be taken into account when considering transfer passenger development at Heathrow since 2000. First of all, Heathrow became a more attractive transfer airport due to T5, with shorter transfer times. Secondly, BA may have increased its transfer traffic through the acquisition of BMI. Third, the

economic crisis is likely to have resulted in pressure on OD demand and as a consequence, more transfer traffic to fill the empty seats. Finally, CBI¹⁶ shows that transfer shares are lower at constrained hub airports compared to unconstrained hub airports. Hence, we see no reason for concluding that the assumption regarding the crowding out of the transfer traffic is not a valid one, taking into account the price sensitivity and yields in the transfer market.

InterVISTAS on scarcity rents. Submission by Gatwick Airport Ltd.

In reference to the ITF/SEO study, InterVISTAS questions the extent to which airline scarcity rents exist in the short haul market in particular, given the low to negative airline margins. Absence of scarcity rents in the short-haul market will have an impact on the extent to which airlines can absorb cost increases.

Furthermore, according to InterVISTAS the ITF/SEO modeling of scarcity rents appears to imply that each airport has its own distinct, closed market. Competitive impacts from neighboring airports seem to be ignored. Therefore, in the event of Gatwick expansion, scarcity rents continue to rise at Heathrow. The modeling suggests that passengers would pay increasingly high fares at Heathrow until they are priced out and then they would not travel at all.

Review of InterVISTAS' comments

As far as the possible absence of scarcity rents in the short-haul market is concerned, InterVISTAS comment may be valid. Frontier Economics confirms this point in its econometric analysis. As the short-haul Gatwick services may be more substitutable by other London airports than Heathrow, this could limit the size of the rents that could accrue to Gatwick in comparison to Heathrow. Although this observation may be correct in the current situation, it is unlikely that no scarcity rents will exist in short-haul when excess demand increases further in a 'do nothing scenario'. If airport capacity is not expanded and excess demand keeps on rising, it is unlikely that scarcity rents will not accrue.

We note that the reduction in scarcity rents in the ITF/SEO study has been estimated by increasing the generalized travel costs until demand can be accommodated in the constrained scenarios. The basis for the scenarios is derived from the Airports Commission scenarios. This means that the ITF/SEO model reflects to a certain extent the way the Airport Commission/DfT model handles scarcity rents/shadow costs in different markets.

In relation to the airport markets and catchment areas, InterVISTAS comment is not correct. First of all, competition impacts are calculated by taking into account air services in the entire London airports system. We thus acknowledge that Gatwick is an effective alternative to Heathrow for many routes. Secondly, the ITF/SEO model equates scarcity rents as the difference in generalized travel costs between the Airports Commission's 'do minimum' and capacity expansion scenarios. In other words, in order to match demand and supply in a 'do minimum scenario', the ITF/SEO model increases airline retail prices assuming that airlines will charge what the market can bear. The use of the Airports Commission's scenarios as the basis in the ITF/SEO report means that ITF/SEO modeling procedure implicitly does take into account the impact of capacity scarcity in the overlapping catchment areas of the London airports. It also means that under- or overestimations of scarcity effects in the Airports Commission scenarios replicate themselves in the ITF/SEO results.

¹⁶ CBI (2015). Boosting capacity where it matters most- the nub is the hub. The CBI's position on future aviation capacity.

1.4 Pass-through of higher airport charges

The second issue is the extent to which higher airport charges as a consequence of airport capacity expansion can be passed through by the airlines to the passengers by charging higher air fares or can be absorbed by the airlines through a reduction in scarcity rents. In the submissions and the literature, we see different approaches.

1. From the academic aviation economic literature, it follows that - where airfares are at market clearing level- higher charges will reduce the airline's share of the scarcity rent (Starkie & Yarrow 2000¹⁷). As ITF/SEO (2014) put it: "at capacity- constrained airports with substantial excess demand, expansion will result in a decrease in airline scarcity rents, with potentially lower fares for consumers. On balance, airlines are unlikely to increase airfares. Instead, higher charges will lead to a fall in scarcity rents/ airline margins. In other words, the increase in airport charges following expansion leads to a further reduction in airline margins, as competition brings fares closer to a (higher) cost base". As for other cost types (Emission Trading System costs), Forsyth and Gillen (2007)¹⁸, Forsyth (2008)¹⁹ and Ernst & Young and York Aviation (2007)²⁰ and Oxera (2003)²¹ all show that in cases of constrained airport capacity and presence of economic rents, no pass through at all is likely to occur, as any additional costs would be borne by airlines in the form of reduced scarcity rents. Also the ITF/SEO (2014) estimates assume that airlines fully absorb the cost increases through a lower scarcity rent. The submission of the CAA (2015)²² states that this may indeed be the case in 2030, but that the assumption needs to be checked by the Airports Commission for the period before 2030²³.
2. BA (2015, p. 16) disputes in its submission the existence/magnitude of the scarcity rents, but at the same time states that it cannot pass-through higher aero-charges to passengers, as airlines compete at the margin. BA refers to the CAA Q6 market power assessment as a confirmation of the fact that airlines are not able to pass through costs. As a consequence, if there are no scarcity rents and airlines compete at the margin, higher charges will negatively affect the network, potentially resulting in negative welfare impacts for society²⁴.

¹⁷ <http://www.caa.co.uk/docs/5/ergdocs/starkieyarrow.pdf>

¹⁸ Forsyth, P., Gillen, D. (2007). Climate Change Policies and Impacts on Air Fares. GARS Workshop Cologne, 28-29 November 2007.

¹⁹ Forsyth, P. (2008). The impact of climate change policy on competition in the air transport industry, OECD/ITF Joint Transport Research Centre Discussion Paper 2008-18.

²⁰ Ernst & Young and York Aviation (2007). Analysis of the EC Proposal to Include Aviation Activities in the Emissions Trading Scheme. York, June.

²¹ Oxera (2003). Assessment of the Financial Impact on Airlines of Integration into the EU Greenhouse Gas Emissions Trading Scheme. Oxford, UK.

²² CAA response to the Airports Commission consultation. Increasing the UK's long-term capacity. CAP 1263.

²³ We note that Airports Commission scenarios/DfT model has not taken into account the impact of higher aero-charges.

²⁴ Interestingly, we note that according to NERA, BA has also stated that: "in an industry with very low margins, or even experiencing losses, increases in costs from any source will have to be passed on to consumers in the long term. Whilst some costs may be absorbed in the short term as a result of competitive pressures and an ever present focus among companies in competition to find efficiencies, any rise in airport charges, that affects all users at an airport, would eventually be passed through to passengers in the form of higher fares or lower service levels". See also: RBB Economics (2013). Why increases in airport charges adversely affect airline passengers: a response to Compass Lexecon. A report commissioned by British Airways. <http://www.caa.co.uk/docs/78/ba%20galfinal.pdf>

3. The submission reports of Gatwick Airport Ltd. (2015)²⁵ and Frontier (2015)²⁶ both state that it is unlikely that, given the low margins, that airlines will absorb the cost increases. Instead, they will ultimately pass on cost increases to the passengers, in particular on short-haul routes.
4. NERA²⁷ provides a nuanced view. NERA concludes that whether charges increases affect airline pricing and output (frequency) behaviour depends upon whether airlines' marginal costs increase as a result. Increases in marginal costs are less likely if the marginal cost includes a significant element of scarcity rent. However, the incidence of such scarcity rents, even at a congested airport such as Heathrow, may vary widely between airlines, and between peak demand and off-peak periods. If an increase in passenger related charges indeed led to an increase in an airline's price relevant marginal cost, this would lead directly to an increase in fares by the airline concerned. NERA states that this is more likely in short-haul, than in long-haul markets.

In sum, there are different views and assumptions on how airlines react to increases in aero-charges at airports with excess demand. As far as we know, there is no systematic empirical evidence regarding the level of pass-through at airports with excess demand as far as increases in aero-charges are concerned. The existing studies seem to converge in agreeing that scarcity rents are likely to be lower for short-haul than for long-haul, which would imply that pass-through at an airport with many short-haul services like Gatwick is on average higher than at Heathrow, with a extensive long-haul network. It is likely that scarcity rents -and thus the ability for airlines to absorb higher charges- will differ strongly between airlines with different cost levels/structures, departure times and routes. The question is if –given the long-term and aggregate nature of the long-term scenarios/forecasts produced by the Airports Commission and consultants, this level of detail can be realistically achieved, in particular as very little robust empirical evidence regarding pass-through levels and scarcity rents is available.

For the Airports Commission, this means that the consumer benefits calculated by Airports Commission/DFI, ITF/SEO and Frontier represent the upper limit of consumer benefits and should be interpreted with care. In case of a partial pass-through to passengers, calculated benefits will be lower (due to higher air fares and lower demand). In case of no pass through and airlines already competing at marginal costs, aero-charges increases may lead to network deterioration/ slower network growth, with implications for passenger demand and thus impacts on consumer welfare. Finally, it is important to note that the fact the scarcity rents are *currently* low or non-existent in certain markets or for certain airlines does not mean they will be non-existent or low in 2030 in a 'do minimum' scenario. In other words, growing excess demand is likely to result in larger scarcity rents.

²⁵ Gatwick Airport Limited (2015). Response to the Airports Commission Consultation. Appendix 3 Supporting traffic & competition analysis.

²⁶ Frontier Economics (2015). Response to Airports Commission consultation on evidence. A report prepared for Heathrow Airport, January 2015.

²⁷ NERA. The effects of increases in airport charges at congested airports on airline fares. A briefing note to the Competition Commission. [http://www.caa.co.uk/docs/5/ergdocs/ccreportbaa/app2\(2\).pdf](http://www.caa.co.uk/docs/5/ergdocs/ccreportbaa/app2(2).pdf)



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