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Agenda

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Not mutually exclusive? Assessing competition impacts in an appraisal framework

Textbook economics tells us that competition has benefits for users—lower prices, better quality of service, and greater quantity of output. However, economic appraisals are often silent on the impact of assessed policies or projects on market competition and outcomes. How can the effects of changes in market structure and the level of competition be assessed in appraisals in the transport sector?

The impact of policies and infrastructure projects is usually assessed using an appraisal or cost–benefit analysis (CBA) framework. This involves quantifying the impact on users and providers, which may include benefits to users such as reduced prices, and costs to the provider such as financing costs. However, while standard frameworks and guidance are available to quantify such benefits and costs, the literature is less clear on how CBA can quantify the impact of changes in the competitive environment arising from a change in policy or infrastructure.

Competition effects can occur when the number of firms in a market changes, or when the extent to which firms compete with each other changes. Such developments can affect prices and/or the quality of the product being offered to consumers, and it is important to capture these impacts, which may not be identified in a 'traditional' appraisal. Indeed, the significance of these competition benefits may have been one of the reasons why the UK Competition and Markets Authority (CMA) published a discussion document consulting on the possibilities for greater competition between train operators in the GB rail sector.[1]

What are competition impacts?

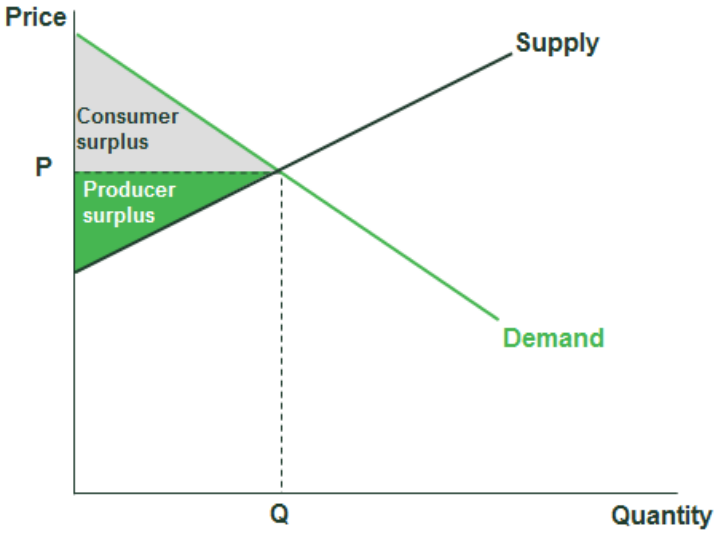
When analysing the user and provider impacts of a policy or infrastructure project, the main parameters of interest are changes in consumer and producer surplus, the sum of which is equal to total welfare.

- **Consumer surplus** represents the value of the service to customers beyond the price they pay for it. In economics terms, consumer surplus is given by the maximum amount that consumers are willing to pay minus the actual price of the services. For example, if a consumer is willing to pay €10 for a product, but actually pays €5, they have a consumer surplus of €5. The total consumer surplus in a market is the combined consumer surplus of all consumers who purchase the product.
- **Producer surplus** represents the difference between the price at which companies would be willing to supply a product or service, and the price that they are actually able to charge.

Figure 1 below illustrates consumer and producer surplus in a supply and demand setting.

Figure 2 overleaf illustrates how removing a capacity constraint—such as a policy that enables a new runway to be built at a capacity-constrained airport—could lead to a change in the consumer and producer surplus. In traditional appraisals, this would be captured in an overall increase in welfare.

Figure 1 Consumer and producer surplus



Source: Oxera.

Figure 2 shows that increasing quantity shifts the capacity constraint, which leads to a new market equilibrium where prices have fallen from P_1 to P_2 and the quantity supplied has increased from Q_1 to Q_2. The resulting effect is an increase in the consumer surplus. The increase is equal to the area comprising P_1, E_1, E_2 and P_2. However, some of this increase in consumer surplus is at the expense of a reduction in producer surplus, which should be accounted for when analysing the overall impact on users and producers. The producer surplus was initially equal to the area comprising P_1, E_1, A and P_2. However, the fall in prices removes all of the producer surplus, as the new price, P_2, is equal to the average and marginal cost.[2]

Figure 3 is an extension of Figure 2 that includes an additional competition impact.

As in Figure 2, as capacity increases, the capacity constraint is relaxed, price is reduced to P_2, and quantity is increased to Q_2. However, if, continuing the example of a capacity-constrained airport, we assume that the additional capacity leads to greater competition between the airport that has been expanded and other airports, this increases the amount of competition in the market. Increased competition can bring about several impacts. In this example, we assume that the greater level of competition leads to efficiency gains in the market, resulting in lower unit costs (on average). This causes the supply curve to shift downwards from S_1 to S_2. The result is a further price reduction to P_3 and a further increase in quantity to Q_3. The *type* of increased competition that could occur should also be considered, and might include the following.

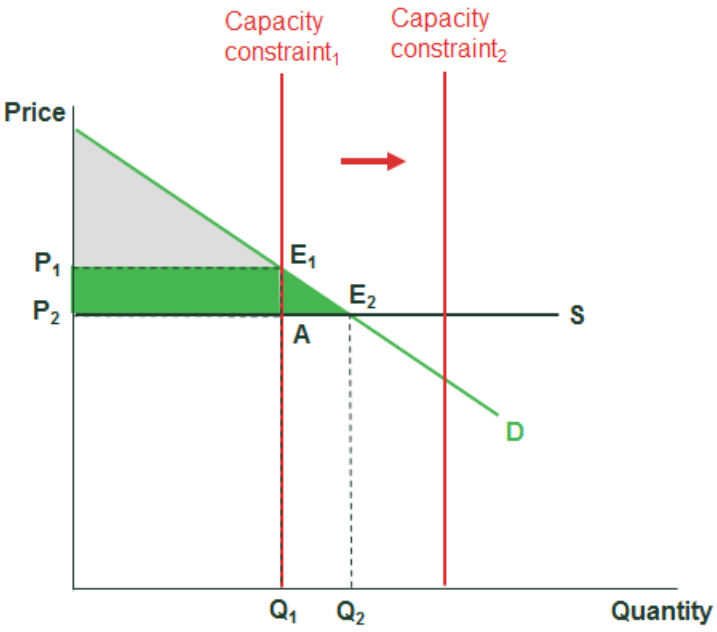
- **More competition at the route level (direct effect)**: new transport infrastructure or changes to policy can lead to new operators entering the market, which can create greater competition.
- **System-wide competition (indirect effect)**: competition may occur beyond the route level. For example, in the aviation industry, airlines do not operate on a single-route basis, and passengers may often have a type of destination in mind (e.g. 'winter sun') rather than a specific destination (e.g. Tenerife).
- **Introduction of alternative business models**: policy changes and infrastructure investment (which creates greater capacity) encourage entry of new transport providers into the market. This can potentially lead to greater competition through the introduction of alternative business models (e.g. the 'no frills' airline model).

Greater competition as described above may produce a number of outcomes that benefit consumers, such as:

- lower prices or increased frequencies;
- increased diversity/quality of products;
- increased innovation.

The extent to which these outcomes occur is likely to be influenced by the type of greater competition that arises—for example, whether it is direct competition only or whether

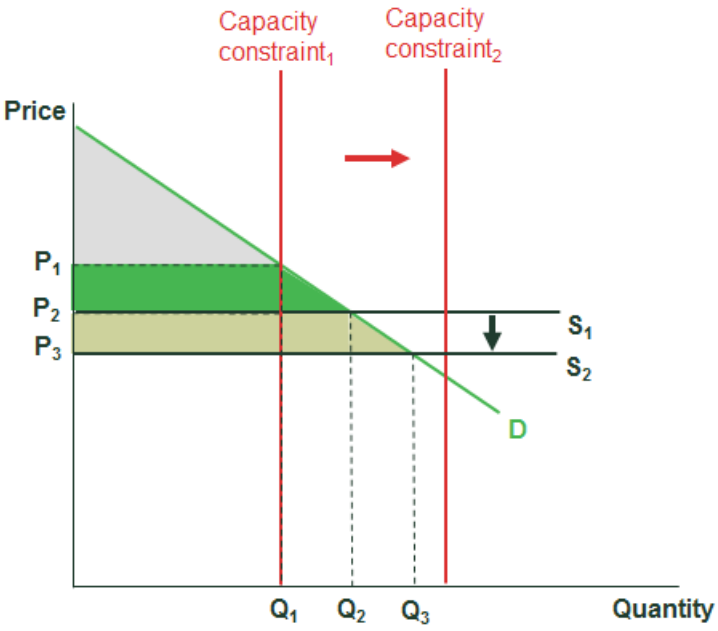
Figure 2 Capacity expansion: consumer and producer surplus



Note: A constant average unit cost is assumed, which is equal to the marginal cost (i.e. there are no economies of scale)—this is represented by the horizontal supply curve (S).

Source: Oxera.

Figure 3 Capacity expansion: consumer and producer surplus with additional competition impact



Source: Oxera.

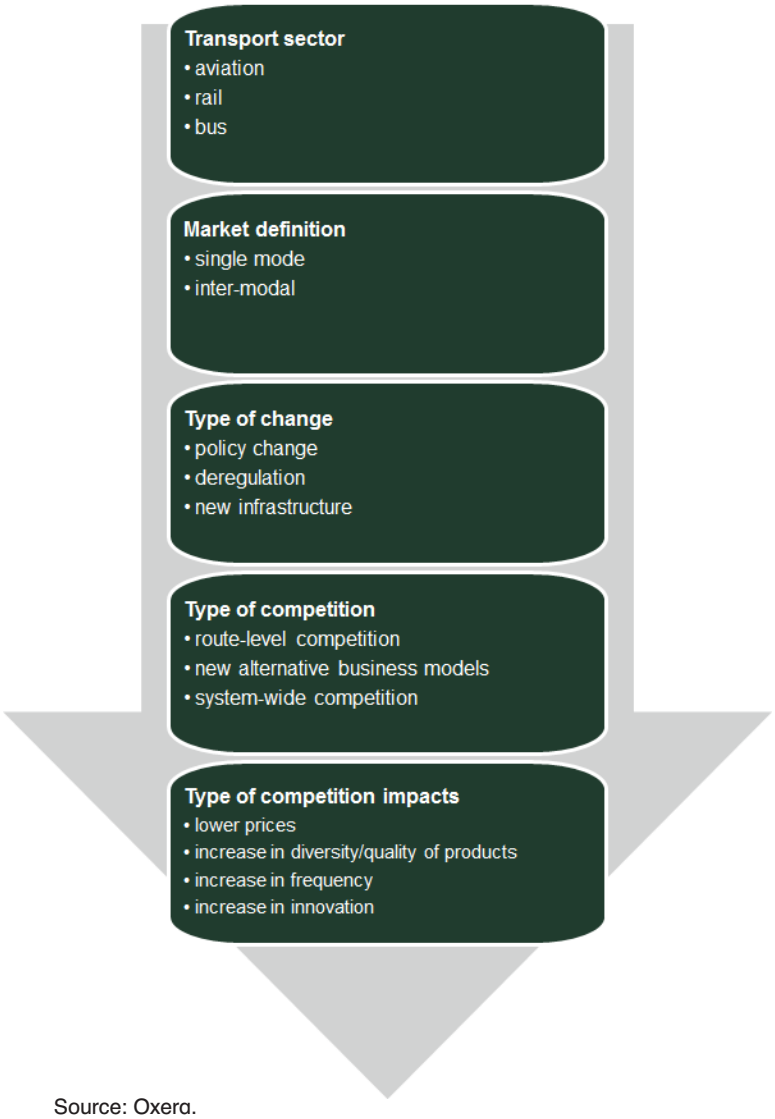
there is an additional indirect effect. Moreover, given the industry and type of greater competition, firms may be expected to compete in different ways after the change in policy/capacity—for example, they may be more likely to compete on either price or diversity/quality. The introduction of alternative business models may also lead to particular outcomes, such as increased innovation.

How can competition impacts be identified?

From the descriptions above, it is possible to outline a framework for how these competition impacts can be assessed. Figure 4 summarises this framework for a transport appraisal.

Figure 4 shows how the specific transport sector being analysed should first be taken into account. In particular, the appraisal should recognise any aspects such as specific characteristics of the sector that affect the level of competition following the change in policy/capacity.

Figure 4 Framework for assessing competition impacts in the transport sector



Source: Oxera.

The market should also be defined, particularly in terms of whether there is a high degree of inter-modal competition, as the benefits from greater competition (e.g. moving from a market with one operator to one with two operators) will be limited if there is already significant competition from an alternative mode of transport.

The type of change can then be analysed—for example, whether it is a policy change or the introduction of a new infrastructure asset. The direct impact of the change should be considered—for example, how much additional capacity will be provided, and who will provide these extra services (e.g. incumbents, new entrants, or a combination of the two). This will affect the extent to which direct competition increases at the route level. In addition, there may be efficiency gains that can be extended to other routes (which would be an indirect effect). Competition may also (or alternatively) result in greater product differentiation and innovation, which can have long-lasting benefits across all transport providers.

Based on the type of change, the type of competition that is likely to occur should then be analysed, which will also depend on the specific transport sector. For example, there may be an indirect effect from system-wide competition in addition to direct route-level competition.

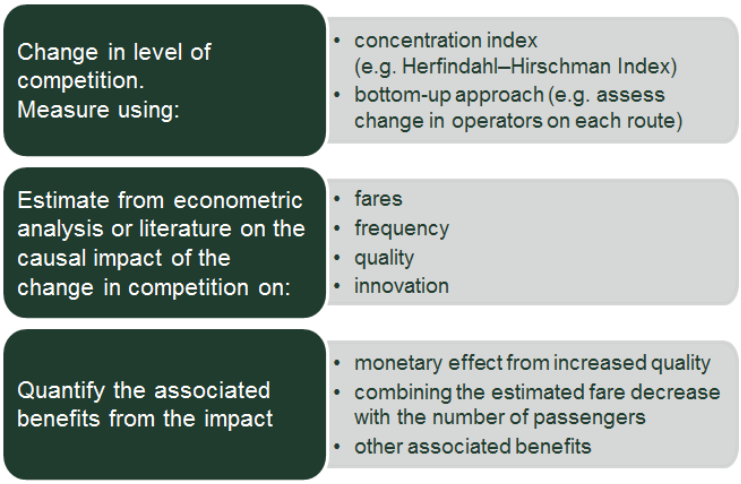
Finally, the appraisal should consider the type of competition impact that is likely to occur. This will be affected by the level of scope that firms have to compete on prices and/or other characteristics. If the market is already very competitive, lower fares may be unlikely unless the greater competition drives efficiency gains, which are passed on to consumers through lower fares. Alternatively, transport operators may compete on the diversity or quality of their products, such as train/bus companies offering free Wi-Fi on their services. It is important to distinguish between the likely types of competition impact in order to quantify them robustly.

How can competition impacts be quantified?

Once the types of likely competition impact have been established, the next step is to quantify them. The quantification approach will depend on the type of impact that is being calculated and the data that is available. If extensive data is available then it may be possible to conduct econometric analysis to estimate the additional competition effect on fares for a proposed transport project/policy. If such data is not available, an alternative approach would be to find estimates from the literature where these effects have been estimated. Figure 5 overleaf includes a suggested approach for how such impacts can be quantified.[3]

The type of competition impact will affect these calculations. For example, if the greater competition leads to transport operators competing on frequency as opposed to prices, one would need to calculate the increased frequency that was due to competition before using appropriate values

Figure 5 Approach to quantification



Source: Oxera.

of time to quantify these time-saving benefits. In another example, greater competition might lead to companies competing on the quality of their service. In this case it may be difficult to quantify such impacts robustly, and a qualitative description may be more appropriate.

One other important point to consider is whether these competition impacts are additional to the standard user and provider impacts (which would be captured in the appraisal); if the standard CBA already incorporates competition impacts then such effects could potentially be double-counted. For example, for a proposed infrastructure project that increases capacity and leads to lower price or greater demand while also creating greater competition, it would be important to determine whether the demand and revenue forecasts account for any competition effect and the resulting impact on fares/demand. This is shown by identifying whether the forecasts account for the additional supply curve shift from S_1 to S_2 in Figure 3, which leads to a further decrease in fares due to the efficiency gains from greater competition.

Conclusions

There is little precedent in the economics literature for combining competition impacts with transport appraisal (CBA). The framework described in this article brings together findings from competition economics theory and the well-defined appraisal literature, and acts as a first step to addressing this gap. Quantifying the costs and benefits in this way may therefore be a useful starting point for assessing the possible competition impacts that may arise from a change in policy or infrastructure project.

This article is based on Martins-Tonks, R. and Meaney, A. (2015), 'How Can the Impact of Competition Be Assessed Within a Cost–benefit Analysis Framework?', European Transport Conference 2015, 28 September.

[1] Competition and Markets Authority (2015), 'Competition in passenger rail services in Great Britain: A discussion document for consultation', 17 July. The CMA also provides some guidance on completing a competition assessment in the context of an impact assessment. However, this guidance focuses on analysing whether a proposal for a new policy/infrastructure project would have a competition effect, rather than how a competition impact could be quantified within an appraisal setting. For more details, see Competition and Markets Authority (2015), 'Competition impact assessment: guidelines for policymakers', 15 September, https://www.gov.uk/government/publications/competition-impact-assessment-guidelines-for-policymakers.

[2] Due to the assumption of a constant marginal cost, the producer surplus is equal to zero. If the marginal cost were upward-sloping, the producer surplus would be positive.

[3] For an example of where this approach has been used, see Oxera (2014), 'Economic Impact Assessment of new runway in South East England', May, pp. 97–113.