

The consumer welfare impact of regulations on the UK licensed taxi markets

Annexe F

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EXECUTIVE SUMMARY

OXERA was commissioned by the Office of Fair Trading (the OFT) to analyse the impact of the regulation of hackney carriages on consumers. This entailed two main pieces of empirical research:

- modelling the effects of regulation of hackney carriages, which involved the identification of the key factors that influence consumer welfare in relation to taxi services (price, waiting time and quality of service), and analysing the impact of the current regulatory regime on these factors,
- undertaking consumer surveys, which investigated in greater depth the factors influencing consumer welfare, and enabled consumers' valuations of the identified factors to be calculated.

This Executive Summary presents the main results of both pieces of research. In total, OXERA prepared three papers during the course of this research:

- 'Taxi Markets Literature Review', which reports the literature review undertaken, and explores the theoretical relationships underlying the research,
- 'Modelling the Effects of Taxi Regulation', which provides an empirical assessment of the impact of taxi regulation,
- 'Consumer Survey Report', which presents the results of the consumer surveys undertaken.

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E1. MODELLING THE EFFECTS OF REGULATION

The empirical assessment of the impact of the regulation of hackney carriages on consumers involved identifying the key factors that influence consumer welfare, and then analysing the impact of the current regulatory regime on these variables.

The literature survey carried out to support this work, and the consumer surveys also undertaken by OXERA, revealed that fares and waiting time are very important to consumers. In addition, the revealed-preference (RP) survey, which formed part of the consumer survey research, identified that consumers are very concerned about the quality of the services they receive.

The research identified three main factors that influence consumer welfare in relation to taxi services in the UK, and were the subject of the empirical analysis in this study:

- fares
- waiting time
- quality of service.

The OFT provided OXERA with a number of data sources, which were augmented by OXERA's own research of other publicly available data. This data enabled models to be constructed at the individual level, and at the local authority (LA) level, aggregating across all the consumers in the relevant LAs. In general, the results show that most of the anticipated effects of regulation in the taxi markets are supported by empirical analysis, but that the magnitude of these effects is relatively small. The main results obtained from this modelling exercise are summarised below, looking first at the effects of quantity regulation (ie, restrictions on entry), and then at those of quality-of-service regulation.

E1.1 Effects of quantity regulation

Waiting times

If the number of hackney carriages in a particular LA were restricted, this would lead directly to higher waiting times than would be the case in the absence of entry regulation. These higher waiting times would also deter

some potential consumers from using hackney carriages, reducing the overall level of demand. These reductions in demand would (for a given level of supply) have a mitigating effect on the increase in waiting times created by the entry restrictions, as fewer customers would be waiting for the same number of taxis. Despite this mitigating effect, the net result is that waiting times would be expected to be higher if there were entry regulations.

A number of proxies for entry regulation were used in the modelling. One was the ratio of private hire vehicles (PHVs) to hackney carriages (this would be higher, the tighter the restrictions are on the number of hackney carriages). The OXERA modelling using this proxy demonstrated that waiting times would be about two per cent longer in LAs with a higher number of PHVs per hackney carriage. Another proxy used in the modelling of waiting time at taxi ranks was the number of hackney carriages per head of population, which also suggested that waiting times are longer when entry is regulated.

The time during which there is excess demand at taxi ranks was also modelled, with 'excess demand' defined as the proportion of ranks where two or more people are waiting during any given hour. This model suggested that excess demand would fall by around seven per cent if entry restrictions were lifted. Entry regulation appears to have a greater effect on excess demand during peak periods – the highest elasticity of 9.6 per cent was achieved when examining peak periods only.

Fare levels

Entry deregulation can have an ambiguous effect on the level of fares. If deregulation leads to more price competition between a higher number of hackney carriages and PHVs, it could put downward pressure on fares. However, the likely expansion in supply could also result in reduced occupancy rates, creating pressure for prices to rise.

The modelling indicates that deregulation could result in a four per cent reduction in fares, based on observed (cross-sectional) differences between entry-regulated and non-entry-regulated LAs.¹ This estimated reduction follows from a substantial shift in the entry regulation proxy variable – the ratio of PHVs to hackney carriages – and has a relatively low price effect. The reduction could be explained by the fact that all fares in the sample were regulated, which results in considerably dampened price movements.

Quality of service

Entry regulation may have a positive or negative impact on quality of service. For example, if operators invest more when entry is regulated, quality of service may rise; this may be the only way for hackney carriages to differentiate themselves. Operators may also invest more in quality of service when entry is regulated, as the risk of business failure is lower. By contrast, quality of service may be lower when entry is regulated if operators are protected by the licence system and do not need to compete on this factor; the reduction in the number of hackney carriages may mean that consumers have to take the first one available, rather choosing one according to the quality of service.

In modelling quality of service at the LA level, none of the regulation variables was significant. The only significant variable in this model was the level of concentration in market shares. This was negatively related to quality of service, which suggests that greater concentration results in lower quality of service.² At the individual level, entry regulation was significant, with a positive relationship – ie, more entry regulation implies higher quality of service.

¹ Time-series information available showing how the numbers of taxis and PHVs changed as a result of deregulation was unfortunately not available for this research.

² The relationship between concentration and the level of competition is complicated; however, in general, the higher the level of concentration in the market, the weaker the competition in that market is likely to be.

E1.2 Effects of quality-of-service regulation

Fare levels

At the individual level, the modelling showed that quality-of-service regulation had positive effects on perceived fares, as did the level of economic activity.³ Quality-of-service regulation, in general, resulted in an increase in fares of around 1.5 pence per trip, while requiring disabled access alone increased fares by one pence per trip.

Quality of service

Quality-of-service regulation was expected to have a positive effect on consumers' perceptions of the quality of taxi operators' service. However, in the modelling of quality of service at the LA level, none of the regulation variables was significant. As noted above, the level of concentration in market shares was the only significant variable in the model at the LA level. This was negatively related to quality of service, which suggests that greater concentration results in lower quality of service.

At the individual level, quality-of-service regulation did not explain the perceived level of quality of service in the market. The level of economic activity was positively related to quality of service, while concentration and population density had negative effects.

The modelling work undertaken therefore found no relationship between the regulation of quality of service and consumers' perceptions of quality of service in the market. This is an anomalous result. The difficulties in finding support for the expected relationships may be due to the relatively weak dependent variable specification that had to be used.

³ In the modelling, the measure of perceived fares was derived from Halcrow surveys, in which respondents were asked to state their perceived fare for a daytime three-mile trip.

E.1.3 Summary of modelling results

Table E1.1 summarises the results of the modelling exercise in relation to consumer welfare.

TABLE E1.1: IMPACT OF REGULATION ON CONSUMER WELFARE—SUMMARY

	Perceived fare	Waiting time	Actual quality of drivers and vehicles provided by hackney carriage services	Overall effect on consumer welfare
Entry regulation	Perceived fares raised by entry regulation – it is associated with a 3.9–4.9% increase in fares	Raised—entry regulation is associated with a 2–7% increase in waiting time or excess demand	Quality raised	Ambiguous: reduced by the fare and waiting time effects, but raised by the quality-of-service effects
Quality-of-service regulation	Perceived fares raised by quality-of-service regulation	Not measured	No impact	Negative welfare impact

Source: OXERA analysis.

E.2 CONSUMER SURVEY RESEARCH

OXERA designed and analysed two surveys of consumers during this research, and the fieldwork for both was carried out by TNS. The first was the RP survey, designed to gather information not only about consumers' recent usage of taxis, but also their preferences in relation to taxi services. The results of the RP survey were used to inform the design of the second survey, a stated preference (SP) survey to gather information that would enable valuations of the factors that influence consumer welfare to be calculated.

The information gathered from the RP survey supplemented the preliminary conclusions drawn from the literature review about the factors that influence consumer welfare. Respondents were asked not just about price and waiting time – the two factors most frequently identified in the literature – but also about safety, and a number of other factors that were expected to influence consumers' assessment of the quality of the service, such as drivers' knowledge of the area and the design and cleanliness of the vehicle.

The results of the survey supported the expectations that both price and waiting time would be rated highly by respondents. One notable finding was that more respondents rated quality-of-service measures, such as cleanliness and driver's knowledge, as 'highly important' than did so for price. This finding led these factors to be included as attributes to be tested in the context of the SP survey.

A principal objective of the research was to define a consumer choice function for the use of taxis based on a conjoint analysis, which would allow consumers' relative valuations to be compared. The SP exercises involve individuals being offered choices between hypothetical alternatives characterised by a number of relevant attributes. The choices made indicate the relative importance that individuals attach to the various attributes, and suitable statistical analysis of these choices enables empirical estimates of the importance of the attributes to the individuals to be calculated. The advantages of SP stem from its approximation to a laboratory-controlled experiment. Although there is no

control over the responses provided by individuals, there is precise control over the scenarios offered to them.

Six SP exercises were designed, with each respondent answering two. The first was chosen according to whether the respondent had recently hailed a hackney carriage from the street, hired a hackney carriage from a rank, or booked a PHV, either for immediate use or in advance. If the respondent had answered questions in the first exercise about choices between the same type of taxi (ie, hackney carriage versus hackney carriage), the second exercise asked them about choices between different types of taxi (ie, between hackney carriages and PHVs). Conversely, if the first exercise gave choices between different types of taxi, the second exercise asked them about choices between the same type of taxi.

The results produced valuations for waiting time, walking time, punctuality and quality of service (covering driver quality, and vehicle type and cleanliness). The results of the SP research can be summarised as follows:

- **waiting time** – most of the valuations of waiting time (18 out of 21) are between eight pence and 25p/minute. Respondents with higher income have, as expected, higher valuations of waiting time; while the valuations of those on low income, or without access to a car, are at the bottom of this range
- **walking time** – the range of the estimated values for walking times is between 6p and 37p/minute. As for waiting times, the valuation of walking times rises in relation to respondents' income, as would be expected
- **driver quality** – the only statistically significant measure of driver quality was the lowest quality-of-service combination of poor driving quality and driver knowledge. This result demonstrates that respondents earning more than £10,000 per year would pay between £3.52 and £4.26 to have a taxi driver with excellent driving and good knowledge of the route and destination, rather than one with poor driving and knowledge of the route and destination

- **vehicle quality** – none of the estimates for vehicle quality (ie, cleanliness and age) was found to be significant in either of the two exercises in which they were included. Respondents would therefore not be prepared to pay additional amounts for improvements in vehicle cleanliness or age,
- **vehicle type** – respondents were prepared to pay a premium for certain types of vehicle (people carriers, Mercedes and Black cabs) relative to a standard saloon car.

The results relating to driver and vehicle quality suggest that consumers do value certain minimum standards. However, provided the quality of service does not fall below these minimum standards, consumer welfare may not be increased by stringent regulatory measures that seek to raise quality of service.

Overall, the results support most of the expected outcomes identified in the literature review, and suggest that the key factors that influence consumer welfare could be increased by deregulation of the taxi markets. Taken together, the two pieces of research undertaken by OXERA provide quantitative information that will enable the OFT to calculate the welfare benefits that could be generated by deregulating entry.