

Evaluating the impact of the taxi market study

A report for the OFT by Europe Economics

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CONTENTS

<i>Chapter/Annexe</i>	<i>Page</i>
1 Executive summary	1
2 Introduction	9
3 Background	12
4 Research	27
5 Conceptual framework of assessment	31
6 Overall assessment	41
A Bibliography	52
B LA survey questionnaire	54
C List of organisations interviewed	57
D Theoretical analysis of the welfare impacts of de-restriction	58
E Key findings	70
F Quantifying the impact of the 2003 study	101
G Glossary	132

1 EXECUTIVE SUMMARY

- 1.1 In 2003 the Office of Fair Trading (OFT) carried out a market study of the regulatory framework affecting licensed taxis and private hire vehicles (PHVs) in the UK. The study looked at the main categories of regulation – quantity regulation and fare regulation (which could affect taxis but not PHVs) – quality and safety regulation (which affected both taxis and PHVs). Regulation is carried out by local licensing authorities (LAs).
- 1.2 The OFT study concluded that the overall quality of taxi services could be enhanced by reforming regulation. There were compelling reasons for maintaining quality and safety regulation which set driver and vehicle standards, but there was scope for improvement through the development of best practice guidelines. There were sound reasons to regulate fares in the taxi sector, but there should be scope for fare competition below a regulated maximum. The report recommended that LAs which placed limits on the quantity of taxi licences issued should lift such restrictions.
- 1.3 The study identified a number of benefits to consumers that should flow from adoption of its recommendations. Removing quantity restrictions could increase taxi numbers by 30 per cent in affected areas and reduce passenger waiting times. This could save passengers 2.5 million hours across the UK. Increased taxi numbers would also reduce the scope for the operation of illegal taxis, and thus contribute to enhanced passenger safety.

Key features of the market

- 1.4 The taxi and PHV market can be divided into two segments: the street and rank hiring segment and the pre-booking segment. Only taxis can operate in the first segment, while both taxis and PHVs can operate in the second. Quantity restriction and fare regulation apply to the street and rank hiring segment.
- 1.5 The street and rank hiring segment has a number of special features which affect the way the market operates and which may justify certain

types of regulation. Individual taxis do not have an incentive to and, for the most part, cannot compete with each other.

- 1.6 In terms of regulation, the bargaining position of consumers in the street and rank hiring segment means that the regulated maximum fare is, in practice, the actual fare charged. There also continues to be quantity control on the number of licensed vehicles in a large number of local authorities.
- 1.7 The pre-booking segment does not exhibit the same degree of market complexity, and is subject to lighter regulation.
- 1.8 Taking these features into account, the net impact in the street and rank hiring segment of removing the quantity restrictions ('de-restriction'), while regulated prices in restricted and de-restricted areas remain broadly in line, is unclear. De-restriction should lead to lower passenger waiting time and more taxi journeys with corresponding benefits to consumers. New taxi drivers should also benefit from the change. However, existing taxi drivers will see increased costs per taxi journey through having to wait longer for each fare.
- 1.9 The net impact on the pre-booking segment of de-restriction in the street and rank hiring segment is also ambiguous. It remains unclear how price, passenger waiting time, and driver waiting time for pre-booked cars might change.
- 1.10 Based on theoretical analysis, the overall impact on consumers and suppliers of taxi services of the removal of quantity restrictions without any related price adjustment is therefore unclear.

Developments since the 2003 study

- 1.11 In order to assess the impact of developments in the sector since the 2003 study, we commissioned Halcrow to carry out quantitative case studies in Sheffield, Wolverhampton and Cardiff, which have all removed quantity restrictions on taxi licenses in the past ten years. We also drew on eight other studies conducted by Halcrow for LAs, seven of which have not removed quantity restrictions.

- 1.12 We have adopted a quantitative case study methodology because we believe it is the most cost-effective way of determining the rough scale of the impact of the 2003 study. However, the small sample size means that any generalisation of the findings must be treated with extreme caution. Indeed, if we treat the results of our case studies as a statistical sample, then all the financial impact calculations that we present below are statistically indistinguishable from zero at a 75 per cent confidence level. As such, we cannot recommend using our estimates of impact alone as an evidentiary basis for policy change. This is particularly the case with the findings on driver waiting time, for which there was a very wide dispersion of results.
- 1.13 Despite these caveats, we believe it is informative to present best-guess estimates of the impact of the 2003 study based on the information we have available. We present a range of estimates based on different assumptions about how to extrapolate the limited data set to the whole market. The ranges do not capture the entire underlying uncertainty about the significance of the data and as such the true impact of the market study could therefore lie well outside the ranges presented.
- 1.14 Around one third of all the LAs which had quantity restrictions in 2003 have de-restricted since then. Most of the benefits to consumers of de-restriction outlined in the 2003 study have been realised in the newly de-restricted LAs. The number of taxis in newly de-restricted areas grew by around 30 per cent between 2003 and 2007. In contrast the number of taxis in LAs which remain restricted barely changed during the same period.
- 1.15 Evidence from the sample LAs tells us that the average passenger waiting time has decreased significantly since 2003 in both restricted and de-restricted areas, but the reduction in waiting times has been greater in de-restricted areas. In our sample LAs, the average reduction in passenger waiting time for taxis hired at ranks was 10 percentage points greater in de-restricted than in restricted areas.
- 1.16 The amount of time taxi drivers wait between fares has increased in both restricted and de-restricted areas, but with considerably larger increases in de-restricted areas. In our sample LAs the average increase

in driver waiting time of taxis hired at taxi ranks was 77 per cent more in de-restricted than in restricted areas. This increase in driver waiting time is significantly greater than the reduction in passenger waiting times although account must be taken of the small samples for both observations. This suggests a decrease in the productive efficiency of the taxi industry – the benefits to consumers in terms of decreased waiting time are more than offset by the costs to taxi drivers of providing an improved service.

- 1.17 We have produced best-guess estimates of two elements of consumer benefit from de-regulation in the street and rank hiring segment. First the observed reductions in waiting time have been combined with values of time published by Department for Transport (DfT) to give estimated annual savings across all of the LAs that have de-restricted since 2003 of between £1 million and £3.5 million. We have also estimated the potential consumer benefit that would be realised if de-restriction were to be extended to those areas that continue to operate quantity restrictions. This potential benefit is in the range £2 million to £10 million.
- 1.18 The second element in consumer benefit comes from additional taxi journeys as a result of the improved service following de-restriction. For this we have estimated the increase in utility or value to customers of the taxi service compared with using a pre-booked car or other transportation modes. The annual benefit in de-restricted areas is estimated to be around £1 million with a corresponding potential benefit of around £3 million in areas that currently remain restricted.
- 1.19 Taking these two elements together, the effect in the 48 LAs that have de-restricted since 2003 has been estimated annual consumer benefits in the street and rank hiring segment ranging from about £2 million to £5 million, depending on assumptions. The potential benefit from further de-restriction is in the range £5 million to £13 million.
- 1.20 We have also estimated the additional cost of providing taxi services in de-restricted areas resulting from the additional driver waiting times that we have observed. We have adopted two alternative approaches. First we have estimated the cost to existing taxi drivers based on the

elimination of the licence premium. Without quantity restriction there is no need to pay for a premium for a licence when you can get one for a nominal sum from the LA.

- 1.21 We have taken the licence premium as a proxy for the higher taxi utilisation achieved under quantity regulation. This suggests an annual cost per taxi of around £3,000. Grossed up over the number of taxis prior to de-restriction, this gives an estimated annual increase in costs following de-restriction of £15 million. An alternative approach is based on the observed increased waiting times after de-restriction valued either at the same values as we have used for passenger waiting or at the value of the minimum wage. This gives increased costs in the range £12 million to £31 million per year. The fact that both these estimates point to increased costs on a similar scale provides a valuable 'sense check' in the presence of uncertainty about the data.
- 1.22 The loss in productive efficiency of the market that we have been able to estimate taking into account both the increase in driver costs and the improved quality of service resulting from the reduced passenger waiting time is between £8 million and £29 million per year. Again, the small sample size means our estimate of the net effect on productive efficiency is statistically indistinguishable from zero. However, we can confidently conclude that the effect on productive efficiency is much more likely to be negative than positive.
- 1.23 This is consistent with reviews of earlier economic research which found that where entry control was abolished but fares control was maintained at the existing level, there was an increase in consumer surplus but a reduction in overall welfare as the increase in taxi numbers led to cost increases.
- 1.24 Our estimates have been based on our observation that there had been no appreciable difference in the change of regulated fares between the LAs de-restricted since 2003 and the rest of England and Wales. Fare rigidity encourages drivers to remain in the taxi sector and accept the longer waiting times while reducing the number of new consumers entering the market. Where de-restriction leads to excess entry and higher costs in this way, then reduction in regulated price might be

expected both to decrease cost per journey and increase consumer welfare.

- 1.25 In addition to the effects we have been able to estimate, there are other impacts of de-restriction that we have not been able to quantify due to limited data availability. We have also not taken account of transitional impacts of change or impacts occurring outside the taxi market. Combined with the statistical uncertainty of our results, we cannot therefore reach a firm conclusion on the full welfare impacts of de-restriction.
- 1.26 Finally we have considered the extent to which the welfare effects outlined above can be attributed to the OFT study. It is our view that some benefits would have occurred even without the study. There has for some years been a trend towards de-restriction which would have continued. There were also external factors, particularly the implementation in 2005 of the Licensing Act 2003, which we have taken into account in comparing restricted and de-restricted areas. Nonetheless, our survey of LAs showed that the OFT's work and related follow-on action was an important factor in the decision to move to de-restriction. Overall our view is that the 2003 study was an important, but not the sole factor leading to further de-restriction. We cannot make a precise attribution of influence but, in our view, it would be reasonable to attribute between half and three quarters of the observed welfare effects to the 2003 study.
- 1.27 We have not been able to obtain any data on either the usage of illegal taxis or illegal taxi related crime. However the increase in licensed taxis following de-restriction should reduce the opportunity for illegal taxis to operate with corresponding benefits to consumers. Enforcement in respect of completely unlicensed vehicles and PHVs illegally plying for hire remains an important issue.

Comments and lessons for future work

- 1.28 The 2003 study provided a detailed and well-informed review of the market for taxi services. Its recommendations and the follow-on actions which ensued, have, as indicated above, been influential in encouraging

further de-regulation which has resulted, as the report anticipated, in an increase in taxi numbers and a reduction in customer waiting time.

- 1.29 We have estimated the value to consumers of these reduced waiting times and a corresponding further potential benefit if de-regulation was extended across the whole market. There was no explicit valuation of this benefit in the 2003 study. In addition we have estimated a loss in productive efficiency associated with the increase in driver waiting time following de-regulation. This effect was not addressed in the 2003 study.
- 1.30 In carrying out this evaluation we have identified some further aspects of the work which might have been approached differently, and from which we have drawn lessons to be taken into account in future market studies.
- 1.31 In our assessment of consumer benefit resulting from the 2003 study we have been very conscious of the complex interactions involved in the market for taxi services. This complexity was acknowledged in background work for the 2003 study. The description of the market, for example, provides information on the respective scale of the taxi and PHV sectors, and of their different regulatory regimes, but does not consider interactions between the two types of service, or the factors affecting consumers' choice between them.
- 1.32 More detailed analysis of different elements in the market would have given the OFT a better understanding of the welfare implications of the changes it proposed, and would have enabled it to provide an estimate, albeit subject to qualifications, of the value of consumer and other benefits or detriments.
- 1.33 This would also have allowed the OFT to present a fuller picture of the operation of the market which would have added to the credibility of its findings and recommendations and would have provided a stronger basis for responding to criticisms of the study.
- 1.34 The provision of taxi services is unusual both in the way in which market interactions take place, and in the extent of regulatory intervention. As such it may not be typical of the types of activity likely to be the subject

of an OFT market study. Nonetheless we consider that there are some general lessons for future market studies which can be drawn from the comments we have made on the 2003 study.

- First, in order to provide a focus for analysis we suggest that each market study should start with a clear statement of how the relevant market has been defined including a review of potential substitute products.
- Second, before making recommendations for change, each market study should include an assessment of the consumer detriment arising from the status quo and the benefit to be expected from change.
- Third, when making recommendations related to regulated sectors the OFT should take account of interactions between different regulations, particularly in cases where a partial deregulation is being recommended. Particular attention should be paid to the impact of continued price regulation in situations where other forms of regulation are being relaxed.

1.35 Finally, although the OFT's principal focus is on how markets are working for consumers it should also take into account the wider welfare effects of any proposed changes. Where changes may create significant losses to the producers of goods or services, not related to the exercise of market power, this may increase resistance to change and act as an obstacle to beneficial longer term developments. Consideration of transitional arrangements may be necessary.

2 INTRODUCTION

2.1 In March 2007, Europe Economics,¹ an independent economics consultancy, was commissioned by the Office of Fair Trading (OFT) to evaluate the impact of the OFT's 2003 market study into the taxi and PHV sector in the UK (the 2003 study).²

This study

2.2 The aim of this study was to improve the OFT's understanding of how effective the OFT is in promoting and enforcing competition, and in making markets work well for consumers. The evaluation aimed at meeting two needs:

- external accountability: to evaluate whether the OFT delivers its objectives and does so cost effectively to the taxpayer (HM Treasury) and Parliament, and
- internal management: to use formal evaluation to help inform prioritisation of work and choice of methods of intervention that are likely to have the greatest impact, and how best to follow these through.

2.3 Specifically, the OFT suggested that this study should not replicate the work involved in the 2003 study. Instead it should identify, and quantify in monetised terms:

- the impact the 2003 study has had on consumers of taxi and PHV services since its publication in 2003. In doing so, the research was required to address how the 2003 study has affected:
 - taxi numbers
 - waiting times

¹ For more information, please visit our website: www.europe-economics.com

² Office of Fair Trading (2003) 'The regulation of licensed taxi and PHV services in the UK', www.offt.gov.uk/advice_and_resources/resource_base/market-studies/taxis

- fares
 - quality of service (including vehicle cleanliness and safety, driver training, and number of illegal taxis)
 - the cost to the Exchequer and consumers of the measures necessary to create this effect.
- 2.4 In particular, the primary focus of the analysis should be on the effects of the removal of quantity restrictions on the number of licensed taxi vehicles.
- 2.5 The evaluation was also required to discuss the impact of the 2003 study on the different members of the taxi and PHV sector such as drivers, vehicle owners, licence owners, and taxi and PHV operating firms.

Structure of the report

- 2.6 The structure of the report is as follows:
- Section 2 describes the market study undertaken by the OFT in 2003, and introduces the sectoral and regulatory background of the taxi and PHV sector in the UK
 - Section 3 describes the research we have undertaken
 - Section 4 sets out our conceptual framework for analysing changes in the market
 - Section 5 presents the key findings from this research, assesses the impact of the 2003 study and, in the light of our findings, includes our estimates of benefits to consumers and continuing areas of consumer detriment, and sets out some general lessons for future OFT market studies
 - Annexe 1 lists the literature we have reviewed during this study
 - Annexe 2 includes the questionnaire sent to all licensing authorities in Britain

- Annexe 3 lists the organisations interviewed during this study
- Annexe 4 explains the detailed economic analysis of the welfare impacts of de-restriction
- Annexe 5 presents the main findings from our research
- Annexe 6 explains in detail our calculation of the impact of the 2003 study, and
- Annexe 7 reproduces the glossary of main terms from the 2003 study, which we have followed in our study.

3 BACKGROUND

Taxi regulation³

- 3.1 Taxi regulations in the UK apply to four distinct areas: London, England and Wales (outside London), Scotland, and Northern Ireland. Because quantity restrictions on taxis do not exist in Northern Ireland, for the purposes of our report we focus on the first three areas.

Licensing

- 3.2 In England and Wales (including London) and Scotland, taxi and PHV vehicles and drivers must be licensed.⁴ In England and Wales, PHV operators must also be licensed. Licensing is performed by LAs. The power to licence taxis was granted to the LAs by the Government under the Town Police Clauses Act 1847 (TPCA 1847) and its subsequent extensions. The power to issue PHV licences and supplementary provisions for taxi licensing came with the Local Government (Miscellaneous Provisions) Act 1976 (LG(MP)A 1976); however, London did not adopt this legislation, and until 1998 PHVs there were not licensed. The London licensing authority is Transport for London (TfL), although the actual issuing of licences is done through the Public Carriage Office.⁵
- 3.3 In almost every LA, taxi and PHV drivers must be licensed separately; but there are some LAs that grant dual licences, so that those who would like to drive in both sectors only need to become licensed once. In Scotland, a licensed taxi driver can drive a PHV, but not the other way around. Although taxis and PHVs can both take private bookings, only the latter are required to be licensed (except in Scotland) to do so.

³ Unless stated otherwise, the reference for this section is: OFT (2003) 'The regulation of licensed taxi and PHV services in the UK: annexe A, legal framework of taxi and PHV licensing in the UK' London.

⁴ This is not a statutory requirement in Scotland, but is always done in practice.

⁵ Under the London Cab Order 1934.

- 3.4 Both taxi and PHV drivers must receive licences from the same authorities as their vehicles. If this is satisfied, then it is possible for either to advertise in any jurisdiction in the UK. The driver is free to go anywhere in the country the passenger requires, as long as the job is contracted from within the licensed area. Zones exist where local authorities have reorganised district boundaries and are treated as separate licensing authorities.

Quantity regulation

- 3.5 The original policy for licensing vehicles (TPCA 1847) permitted any number of hackney carriages to be licensed that licensing authorities saw fit. Subsequently section 16 of the Transport Act 1985 stated that:

The grant of a licence may be refused, for the purpose of limiting the number of hackney carriages in respect of which licences are granted, if, but only if, the person authorised to grant licences is satisfied that there is no significant demand for the services of hackney carriages (within the area to which the licence would apply) which is unmet.

- 3.6 This applies to England and Wales, but not London, which does not have quantity controls. The policy in Scotland is nearly identical. Importantly, quantity restriction policy implies that if an LA denies the licence for a taxi vehicle, the burden of proof is on the LA to show that there is no significant unmet demand in the area under restriction. Unmet demand surveys are commissioned in areas with quantity restriction in place in order to justify the policy. The DfT Best Practice Guidance in 2003 reiterated the necessity of doing this (see *Department for Transport actions* below). There is a history of litigation between taxi operators and LAs over the issue of unmet demand.
- 3.7 PHVs are not subject to quantity restriction anywhere in the UK.

Quality and safety regulation

- 3.8 Quality regulation applies to every type of taxi or PHV licence issued.⁶ As with decisions related to quantity restriction, beyond general provisions, the specific details of quality and safety policies are left in the hands of the LAs. On the other hand, unlike quantity regulations, quality and safety requirements do not differ significantly throughout the UK, or between taxis and PHVs.
- 3.9 The quality regulations largely divide into the following types:
- Driver regulation. Everywhere in the UK, applicants for licences to drive taxis or PHVs must be deemed by local authorities to be 'fit and proper', as stated by sections 59 and 51 of LG (MP) A 1976.⁷ In London and several other LAs, applicants for taxi driver licences must pass 'the Knowledge' test in order to prove that they have the necessary skills to navigate London's organic and complex array of streets.
 - Vehicle regulation. In England and Wales, taxis must meet standards set by LA byelaws as well as satisfy any additional 'conditions of fitness' deemed necessary (for example vehicle age requirements).⁸ PHVs are subject to quality conditions similar to those of taxis. In Scotland, safety and quality requirements are 'virtually identical' for PHV and taxi drivers and vehicles alike.
 - PHV operator regulation. Section 55 LG (MP) A 1976 requires that LAs grant operator's licences only to applicants that they are satisfied are 'fit and proper to hold an operator's licence'. PHV licensing in London began in January 2001, and is subject to the

⁶ Due to the detail that would be required to detail each area of the market to which quality requirements apply, to keep this overview concise we highlight what we believe to be the main relevant requirements.

⁷ N.B.: Local authorities have freedom to define the exact meaning and implied requirements of this phrase.

⁸ This duty was granted to LAs under the TPCA 1847.

requirements of the Private Hire Vehicles (London) Act 1998 (PHV (L) A 1998). Licences for PHV operators do not exist in Scotland.

Fare regulation

- 3.10 In England, Wales, and Scotland, licensing authorities have the power to set maximum fares.⁹ They are empowered to do so by more than one legislative measure, although the LG (MP) A 1976 is the regulation most closely adhered to. It specifically enables LAs to set a table of fares and any other charged fees according to a distance or time scale. They also have the freedom to make reasonable adjustments to the table over time. Although the use of taximeters is not a national requirement, vehicle requirement byelaws of most LAs call for them to be used for tracking fares.
- 3.11 PHV fares are not regulated. Outside of London, PHV drivers are permitted, but not required to use taximeters (however they must be approved by LAs).

The OFT 2003 taxis study

- 3.12 The 2003 study was published by OFT in November 2003, marking the completion of an investigation into the UK Licensed Taxi Services Market which began in August 2002. The rationale for the OFT investigation was characterised by concerns that certain regulatory measures imposed by local authorities may weaken competition, thereby causing consumer detriment. The study examined the experiences of Licensing Authorities (LAs) with different regulatory frameworks and analysed the impacts of regulations that affect the 'overall quality of service available to consumers'.¹⁰

⁹ According to annexe A, 'The power to fix fares is just that—a power rather than an obligation. There are some local authorities in which fares are not regulated at all. However, over 95 per cent of the local authorities that responded to our survey regulate fares' (41).

¹⁰ Office of Fair Trading (2007) 'Statement of Requirements for the evaluation of the impact of the OFT's 2003 Taxi Market Study' London.

3.13 In addition to the in-house analysis performed by OFT, the study was informed by a number of commissioned projects. The data collection and analysis of the OFT and its sub-contractors led to a final report which comprised:

- a review of the legal framework and statistical background
- analysis of existing consumer survey data principally drawn from studies by Halcrow on the use of taxis and consumer values
- case studies carried out by Halcrow of 13 LAs, as well as two detailed after- studies covering a selection of LAs with different quantity regulation policies: restricted, derestricted, and re-restricted
- a licence premium investigation
- a summary of the consumer welfare impact of taxi regulations in the UK
- a comprehensive literature review
- econometric modelling to examine the interaction between different forms of regulation, the links between regulatory environment and fare levels, the factors that determine waiting time; and the factors affecting service quality
- analysis of consumer preferences by means of a revealed preference survey (RP) and a stated preference exercise (SP). The combined results from the two surveys informed OFT about the nature (SP) and reality (RP) governing consumer preferences about quality of taxi service
- an international comparison of taxi regulations
- an omnibus survey commissioned from Taylor Nelson Sofres to establish the usage patterns of taxis and PHVs in the previous twelve months, method of hire, fare levels, and usage of unlicensed taxis, and

- stakeholder interviews carried out by the OFT. 40 representatives from a range of organisations were consulted.

3.14 The report reached the following main conclusions about taxi regulation:

- Quantity restrictions should be lifted. According to OFT, they 'reduce availability and lower the quality of service to the public'. The study found that lifting the restrictions would deliver the following significant benefits to the consumer:
 - increase the amount of taxis in restricted areas by 30 per cent and create more choice
 - reduce the deployment of illegal taxis, thereby making journeys safer for passengers, especially those who are dependent upon taxis such as the elderly and disabled, and
 - save 2.5 million hours across the UK by reducing waiting times.

3.15 Quality and safety regulations were of the utmost importance. On occasion there had been a mismatch between LA policy and driver compliance – including drivers who were overly compliant, and therefore OFT recommended a centralised distribution of Best Practice Guidance from the DfT to all of the LAs.

3.16 Fare regulation was necessary for several reasons, chief among them that it protects consumers in 'vulnerable situations'. However, fare regulation should continue to be in the form of maximum fares: consumers should know that they are able to negotiate on fares, and LAs should assist them in doing so.

Responses to the 2003 study

The Transport Committee

3.17 The Parliament Transport Committee produced two critical responses to the OFT report in February and March 2004, largely centred on the question of quantity restriction. They pointed out a series of what they considered to be fundamental weaknesses in the arguments put forth by OFT. The strongest objections were that:

- There was no 'real evidence' to support the case that waiting times are lower in areas without quantity restrictions. Furthermore, the 2003 study did not acknowledge evidence from the analysis suggesting that fares were lower in *restricted* areas.
- The report was lacking in evidence to support the case for quantity de-restriction. Its quantitative results only seemed to buttress this conclusion after 'adjustments' had been made, the details of which were never fleshed out. Moreover its 'statistical and survey evidence were flawed'.
- The report neglected to consider the relationship between the taxi and PHV markets.
- Although Annexe H ('Modelling the effects of taxi regulation') supported the hypothesis that entry regulation had a positive impact on service quality, the main report neglected to discuss this.
- Although Annexe H concluded that the effect of quantity controls on consumer welfare were ambiguous, the main report 'completely disregards' that conclusion.
- The report did not consider the experience of de-restricted areas that reverted to restriction where the regulatory policies failed.

The Government

3.18 In response to the request raised in the 2003 study, the Government, although declining to implement immediate legislation barring quantity restrictions, 'strongly encouraged', through written letters, those LAs with restrictions in place to remove them. The letters requested that quantity restrictions be removed unless there was 'a strong justification that removal of the restrictions would lead to significant consumer detriment as a result of local conditions'.¹¹

¹¹ Office of Fair Trading (2007) 'Statement of Requirements for the evaluation of the impact of the OFT's 2003 Taxi Market Study' London.

- 3.19 In responding to the Transport Committee's objections, the Government acknowledged all of them and agreed with some. However, it was not deterred from overall acceptance of OFT's conclusion that quantity restrictions should be minimised, since keeping them in place unnecessarily engendered consumer detriment. However, the Government also maintained that the decision to do so was best left to the LAs, and should not be statutory.
- 3.20 The Scottish Executive rejected the recommendation for quantity de-restriction because it did not consider that the evidence presented in the OFT report 'makes a sufficiently robust case to justify the removal of local authorities' powers to restrict the number of taxis in their area'.¹²
- 3.21 The Government was responsive to the suggestions for quality control, and agreed to publish best practice guidance based on research and consultations with LAs, various other stakeholders, and the Scottish Executive.
- 3.22 The Government did not accept the OFT recommendation to facilitate fare negotiations on grounds that it could lead to 'confusion and security problems'.¹³ No action was taken with respect to fare regulation, although the Government did concede that awareness could be raised that set fares are maximum fares, especially in London.¹⁴

Department for Transport

- 3.23 In June 2004, the DfT issued a follow-up letter to all restricted authorities requesting that they review local policy regarding quantity restriction, and publish the results. The message conveyed in the letter

¹² Scottish Executive Media and Communications Group (2004) 'News release: ministers reject removal of quantity controls for taxis' Edinburgh.

¹³ Office of Fair Trading (2007) 'Statement of Requirements for the evaluation of the impact of the OFT's 2003 Taxi Market Study' London.

¹⁴ Cope, Rupert (2004) 'Government request to all councils restricting the number of taxi licences in England and Wales outside London to review Quantity Control policies; Annexe A: the Government's Action Plan for taxis and private hire vehicles in England and Wales' Department for Transport, London.

was clear and direct, and more than anything else reiterated the section 16 prescript of the Transport Act 1985:

The Government considers that, unless a specific case can be made, it is not in the interests of consumers for market entry to be refused to those who meet the application criteria.

- 3.24 Unmet demand surveys should be carried out to ensure that restrictions, where in place, were justified.
- 3.25 Interestingly, the DfT letter states in paragraph 13 that 'for the survey to be effective, latent demand should be taken into account'. This marks a distinct policy shift which contradicts the ruling of the 1989 case *R v. Brighton Borough Council ex p. Bunch*. The case specifically found that the LA 'need only look at patent demand, and need not consider latent demand in the market place' when using unmet demand surveys to establish justification for quantity restriction.¹⁵
- 3.26 Apart from the main letter, the DfT communication included four annexes:
- the Government's Action Plan for Taxis and Private Hire Vehicles detailing specific steps for the LAs to take
 - a complete listing of LAs with quantity restrictions
 - model questions to aid LAs investigating unmet demand, and
 - advice on how to decide, in the absence of concrete disability policy, whether de-restriction should be in favour of wheelchair accessible vehicles.¹⁶
- 3.27 The Action Plan detailed prudent steps towards implementation of government recommendations with respect to quantity, quality and fare regulation. It referred to the conclusion of the OFT report that the DfT

¹⁵ Under the ruling of *R v Brighton Borough Council ex p. Bunch* (1989).

¹⁶ Annexe D is an extract from a previous DfT advice letter in September, 2002.

'promote and disseminate local best practice in applying quality and safety regulations' and aimed to publish guidance by the end of 2004.

3.28 Annexe D, 'Local accessibility policies for taxis prior to taxi regulations being made under the Disability Discrimination Act 1995', explained why policy with regards to wheelchair accessibility requirements for taxis had not been finalised.¹⁷ The DfT initially stated that it would devise and phase in a policy for taxis between 2002 and 2012. But paragraph 1 of Annexe D states:

When we realised that this could not be achieved in a way that would be acceptable to both disabled people and the taxi trade, the Minister announced in 2000 that regulations would not be introduced in 2002.

3.29 Therefore the Annexe offered suggestions on how LAs may best proceed under these circumstances. The emphasis of the note was that the decision about wheelchair accessibility requirements was 'entirely a matter for local consideration and decision'. Furthermore, the DfT urged those LAs holding back on drawing up local policy in anticipation of national guidance not to do so. The note also outlined several suggestions for formulating policy, among them being to invite manufacturers to present vehicles that could then be examined by representatives from disability rights organisations; experience sharing between authorities; and taking into consideration forms of disabilities apart from those that require wheelchairs for transportation.

3.30 After consultation with stakeholders on a draft version in 2005, the DfT issued Best Practice Guidance in October 2006. The Guidance, which

¹⁷ The issue of wheelchair accessibility does not tend to be of as much importance to the PHV sector. According to paragraph 13 of DfT Best Practice Guidance, 'Different accessibility considerations apply as between taxis and PHVs. Taxis can be hired on the spot—in the street or at a rank—by the customer dealing directly with a driver; but PHVs can only be booked through an operator. It is important that a disabled person should be able to hire a taxi on the spot with minimum delay or inconvenience, and having accessible taxis available helps make that possible. For PHVs, it may be more appropriate for a local authority to license any type of saloon car, noting that some PHV operators offer accessible vehicles in their fleet.'

remains in place, is 21 pages in length, and accessible from the DfT website.

- 3.31 While the Guidance exists explicitly to aid LAs to standardise quality and safety regulations, it makes abundantly clear that local authorities are best endowed to set policy. It also stresses the importance of not over-regulating and in so doing imposing excessive costs to drivers and LAs alike. DfT emphasises that LAs

Want to be sure that each of their various licensing requirements is in proportion to the risk it aims to address; or, to put it another way, whether the cost of a requirement in terms of its effect on the availability of transport to the public is at least matched by the benefit to the public.

- 3.32 The Guidance is wide ranging but does not cover all issues. This is deliberate, to re-emphasise to LAs that they are primarily responsible for regulation, even if it means seeking consultation on a local level. Therefore, the Guidance 'seeks to concentrate only on those issues that have caused difficulty in the past or that seem of particular significance'. Examples of topics covered include driver and vehicle age limits, taxi zones, and medical requirements for drivers.

Other relevant developments

National trend towards de-restriction

- 3.33 Through our stakeholder consultations, we have come to understand that, in addition to and apart from the direct impact from OFT's encouragement of LAs to remove quantity restriction, there has been a general trend in the UK towards de-restriction in the past several years. However, no interviewee was able to provide a definitive estimation of the extent of this trend. The establishment of our counterfactual –how many LAs would have de-restricted had the OFT not issued the 2003 study – is discussed in greater detail in the Conceptual Framework section and Annexe 6.

Section 75 legislation

- 3.34 A recent development in DfT legislation has consequences for both taxis and PHVs. The amendment to Section 75 (b) of the Local Government (Miscellaneous) Provisions Act 1976 part 11 in March 2007 requires that vehicles contracting their services for a period of seven days or more must now be licensed. In other words, PHVs contracting themselves out to a range of businesses – such as pubs, hotels, schools – for extended periods of time, which did not previously need to be licensed, would now need licences.
- 3.35 This change could potentially affect a wide range of market participants. According to one stakeholder, this could affect between 100,000 and 200,000 unlicensed PHV drivers. A major impact of the change is that it will be easier for enforcement officers to identify unlicensed drivers, especially in locations with long-term service drivers.

Licensing Act 2003

- 3.36 The Licensing Act 2003 ('the Act'), which came into force on 24 November 2005, was inspired by a Government White Paper in 2000 on reforming alcohol and entertainment licensing. The key goals called for by the Paper were:¹⁸
- to reduce crime and disorder
 - to encourage tourism
 - to reduce alcohol misuse, and
 - to encourage self-sufficient rural communities.
- 3.37 The Act primarily seeks to achieve the above goals by consolidating several important forms of licensing; alcohol licensing, late night entertainment licensing, and late night food service licensing, into one

¹⁸ Queen's Printer of Acts of Parliament (2003) 'Explanatory notes to Licensing Act 2003' www.opsi.gov.uk/ACTS/en2003/2003en17.htm

integrated scheme. Importantly, it also devolves most national licensing supervision to local authorities.¹⁹

- 3.38 Although the Act has had many other social, political and economic impacts, the main impact of interest to the taxi and PHV trade has been the provision of flexible opening hours. Subject to approval, it is now possible for licensed premises to extend their hours to stay open beyond previous fixed hours (for up to 24 hours). The reason given for this is that it helps reduce the disorder that results from all businesses – namely bars and clubs – shutting down at one time.²⁰
- 3.39 The most direct impact on the taxi market is that the previous demand peaks around the fixed pub and club closure time have been smoothed over the later hours of the night and early morning. This could lead to the reduction of waiting time in previous peak times. However, taxi drivers may have to stay out later. One stakeholder we interviewed claimed that in certain areas of the country the taxi trade opposed the Act. Today drivers cite the Act as one reason they now find they must stay out later in order to earn the same revenue as before.

Disability Discrimination Act

- 3.40 The Disability Discrimination Act (DDA) was passed in 1995 to address discrimination faced by disabled members of society. It has been amended numerous times since, (and with it, the definition of disability) most recently in September 2006. In its current form it is divided into three policy areas: employment; access to services, premises and private clubs; and education. In December 2005 the DDA was extended to take into cover people living with HIV, cancer, or multiple sclerosis.
- 3.41 The DDA has significant implications for the taxi sector – according to the DfT website, although disabled people travel a third less than the general public, they make greater use of taxis and PHVs. Amendments

¹⁹ UK Department for Culture, Media, and Sport (2007) 'Licensing Act 2003 explained'
www.culture.gov.uk/what_we_do/Alcohol_entertainment/licensing_act_2003_explained/

²⁰ UK Department for Culture, Media, and Sport (2007) 'Licensing Act 2003 explained'
www.culture.gov.uk/what_we_do/Alcohol_entertainment/licensing_act_2003_explained/

to the relevant Regulations in 2005 made clear that provisions in the DDA did apply to taxis and PHVs. However specific implementing regulations have not yet been introduced and there continue to be variations between LAs on the accessibility requirements for new vehicles.

Implications of technological developments

- 3.42 The relationship between the taxi and PHV sectors may evolve over time, due to technological advances. Darbéra (2007) discusses the revolutionary impacts of the telephone on the taxi market. Before the telephone was widely accessible to all classes, the market for taxis hired on the street was greater than that for pre-booked rides. However, as a result of the telephone's mass use after the 1960s, today the pre-booked market is larger in most cities. The 2003 study found that in the UK 'around 30 per cent of all journeys are from a rank, 10 per cent are hailed on the street and 60 per cent are pre-booked'.²¹
- 3.43 Near-universal adoption of telephones has helped create the pre-booking segment of the taxi market. In the near future, new technologies could potentially revolutionise the street and rank hiring segment.
- 3.44 Two new technologies, the Global Positioning System (GPS) and the General Packet Radio Service (GPRS), are of particular interest to participants in the taxi market. GPS could help taxi radio circuit and PHV operators locate each taxi and PHV on the street, and consumers using GPRS-enabled mobile phones could also be located. It is therefore technologically feasible for consumers to call or text a PHV operator, which would then send one of the PHVs nearest to the consumers to pick up the consumer on the street.
- 3.45 Some stakeholders have suggested that currently the technologies are not mature enough for commercial use. However, as both the adoption rate of such mobile phones and the scale of PHV operators increase, it may soon be more economical for people to 'flag down' PHVs on street

²¹ Paragraph 3.12, Office of Fair Trading (2003) 'The regulation of licensed taxi and PHV services in the UK'.

using their mobile phones rather than waiting for the next taxi cruising on street.²² This would blur the boundary between telephone booking and street hailing: although the PHV is technically pre-booked by the consumer, from the consumer's point of view he or she essentially 'hailed' a 'taxi' using a mobile phone instead of a hand signal on the street. This could lead to significant changes in the business models of market participants in the taxi market and the need for changes in regulation.

²² Predicting the future adoption of technology is always difficult and prone to mistakes, and it is possible that the PGS and GPRS technologies will not be the ones that win the widest adoption, because of either their own limitations or the emergence of better alternative technologies. However, it does not affect our central message, which is that technology advance would have significant implications on how the market works and how regulations should develop accordingly.

4 RESEARCH

4.1 This section explains the research undertaken for our study.

Literature review

4.2 To get a better understanding of the sector and seek empirical evidence, we conducted a desk-based literature review in this study. The literature review involved a three-step process.

4.3 First, we identified a preliminary list of literature to be reviewed. The process involved searches of books, economic journals, and transport journals for materials related to our study, namely taxi sector overviews, relevant regulations especially quantity restriction, and case studies. On first iteration, this yielded thirty papers.

4.4 Second, we then examined each of these papers and selected 15 of them for detailed review, based on the characteristics of each paper including topic relevance, geographic coverage, novelty, data reliability, and whether it was already covered in Annexe G of the 2003 OFT study. For the purposes of our task, we decided to select a majority of empirical materials. Furthermore, higher priority was given to newer materials, and we aimed to avoid any unnecessary overlap with sources used for the OFT Study.

4.5 Finally we reviewed each selected paper in detail and summarised findings. The list of literature that we have reviewed is included in Annexe 1.

LA survey

4.6 To get key information on taxi and PHV licensing decisions on the LA level, especially the extent to which the OFT study influenced de-restriction; we commissioned Halcrow to conduct a survey on all LAs in England, Wales, and Scotland. The survey sought to cover the following issues:

- how and when the taxi and PHV regulations have been changed (if at all) since the 2003 study

- the number of licensed taxi and PHV vehicles and drivers
- taxi vehicle licence premium
- records of complaints (relating to service quality, illegal taxi, etc), and
- opinions on the influences of change in taxi and PHV regulations.

4.7 In total, we sent questionnaire to all the 383 LAs in England, Wales and Scotland, and we received 187 valid responses. Table 1 below presents the number of LAs in our sample.

Table 1: Number of LAs

	Urban	Rural	Total responding	Total in population
England and Wales	86	86	172	345
Scotland	7	8	15	38
Total	93	94	187	383

Source: LA survey

4.8 A copy of the LA survey questionnaire is included in Annexe 2.

Stakeholder interviews

4.9 We conducted 16 interviews with stakeholders in this study. By speaking to stakeholders, we aimed to give them an opportunity to express their views, to get in-depth understanding of the sector from those with the greatest knowledge, and to balance the overall opinions we received. Also we used the interviews to collect information that is difficult to get from other data collection channels (for example LA survey and case studies), such as people's opinions on the extent that the development in the UK taxi and PHV sector after the 2003 study could be attributed to the OFT and how the OFT might have acted differently after the Taxis study to achieve greater impact.

4.10 The stakeholders we interviewed include:

- relevant government and regulatory bodies
- representatives of the taxi and PHV trade, and
- consumer bodies.

4.11 A list of all the organisations we interviewed is included in Annexe 3.²³ All interviews were attended by at least two members of our team. Due to distance constraints, most of the interviews were conducted by conference call. We are grateful for the high level of cooperation and response which we received from all parties.

Case studies

4.12 To collect empirical evidence on issues such as waiting time, we commissioned Halcrow to conduct case studies in three de-restricted LAs: Cardiff (de-restricted in 2005), Sheffield (de-restricted in 2000), and Wolverhampton (de-restricted in 2005). Sheffield was chosen because it was surveyed in the 2003 study and by comparing the results in 2003 and 2007, we could get some information on the long-term and sustainable impacts of de-restriction.

4.13 Each case study includes two components: rank observation and public attitude survey (PA survey).

4.14 The rank observation surveys were used to assess the overall level of passenger and driver waiting times.

4.15 Each public attitude survey questioned between 400 and 500 consumers on their usage of taxis and PHVs. Issues covered included:

- frequency with which they had used a taxi over the last three months

²³ The DfT and OFT provided initial contact details of most of the stakeholders we interviewed. Some stakeholders who were outside of our initial list of interviewees offered to be interviewed, and we took the opportunity to speak to them.

- what method of hire they employed; the satisfaction level with their trips, and
- how the services might be improved in the future.

4.16 It is important to note that if we treat the results of our case studies as a statistical sample, then our estimates for the impacts of de-restriction based on results from rank observations and public attitude surveys, are statistically indistinguishable from zero at a 75 per cent confidence level. The uncertainty of results is particularly strong with the findings on driver waiting time, for which there was a very wide dispersion of results. Despite these caveats, we believe it is informative to present best-guess estimates of the impact of the 2003 study based on the information we have available.

5 CONCEPTUAL FRAMEWORK OF ASSESSMENT

5.1 In this section, we set out the conceptual framework on which we have based our assessment of the impacts of the 2003 study.

5.2 Our analysis takes into account the following issues:

- economic theory on the operation of the taxi and PHV market
- potential welfare effects of de-restriction coupled with continuing fare regulation
- counterfactual (i.e. a view of what would have happened if the OFT had not conducted the 2003 study), and
- caveats setting out the limitations on our approach.

Economic theories on the operation of the taxi market

5.3 In this section we outline economic theories on how the taxi market functions which underlie our assessment of the 2003 study. This analysis is based on our own literature review and that conducted by OXERA in the 2003 study.²⁴

De-restriction and demand

5.4 Taxis and PHVs are part of the wider transportation system and compete with other transportation modes, such as bus and private cars. In order to understand changes in demand for taxi services and calculate the welfare impacts, information on the relevant price and service elasticities (i.e. how the demand for taxi services changes as the price and quality of taxi services change) would be needed.

5.5 Toner and Mackie (1992) highlighted that 'due to the range of consumers serviced by hackney carriages, estimates of consumers' elasticities and values of time are likely to depend on the time of day the

²⁴ OXERA (2003) 'Taxi markets literature review', Annexe G of the 2003 study.

journeys are taken, and their purpose'. More specifically, the authors found long-run price elasticities close to unity (i.e. -1) and low waiting-time elasticities (in absolute terms). This finding is consistent with that of Flores-Guri (2003), which found that price elasticity of demand in New York was close to -0.72 and waiting time elasticity of demand was around -0.47.

- 5.6 If, as is often the case, when an LA de-restricts but keeps its fare regulation unchanged, then the price of taxi services will, naturally, not change. Any change in the demand for taxi services will then only come when de-restriction leads to the entry of more taxi vehicles and a reduction in passenger waiting time. We have no evidence that the regulated price of taxi services has decreased after de-restriction and thus only consider the change in demand due to changes in waiting time.

Segmentation of the taxi market

- 5.7 The traditional division of the taxi market is between taxis and PHVs, probably because they are subject to different regulations. However both types of vehicles provide similar services to customers. In this report we use 'taxi services' for 'taxi and PHV services' (i.e. PHVs booked over telephone are regarded as taxi services for the purpose of this report), 'taxi market' for 'taxi and PHV market' and 'taxi journeys/trips' for 'taxi and PHV journeys/trips'.
- 5.8 However, for the purpose of our analysis, we divide the taxi service market into two broad segments which correspond to the way the taxi services are offered:
- taxi services provided through ply for hire on the streets and at taxi ranks ('street and rank hiring'), and
 - any other forms of provision of taxi services such as telephone booking ('pre-booking').
- 5.9 The first segment can only be legally served by licensed taxis, while all licensed taxis and PHVs can operate in the second segment.

5.10 We believe such market segmentation is better than the traditional division between taxis and PHVs, because these two segments have significantly different characteristics. Darbéra (2007) and Schaller (2006) suggest that there are actually two quite distinct taxi markets. The first is the street hail market, which has features which require certain forms of regulation. In contrast, 'the only regulation required by the second market, the pre-booked market, differed little from that applicable to most other commercial activities'.²⁵ Although we do not necessarily accept this view on the regulations needed on each market segment (making regulatory policy recommendations lies outside our remit), it highlights the need for different analysis and treatment.

Street and rank hiring segment

- 5.11 In the street and rank hiring segment, taxis are hired either through random picking on the street or 'first come, first serve' at ranks. Taxis do not generally compete on merit – they either compete on chance (when cruising on the street) or do not compete at all (when waiting at taxi ranks).²⁶
- 5.12 This causes the interdependence of demand for taxi services among taxis, because when making purchase decisions about street and rank hiring of taxi services, consumers form their expectations on the basis of the taxi market as a whole, rather than on the particular taxi they are going to use. This is because consumers either have no idea of which taxi they will hail on the street or have no choice at taxi ranks.
- 5.13 In addition consumers in general are not in a strong position to negotiate on price when they hire a taxi: Liston-Heyes and Heyes (2005) explain that the costly search for lower pricing among cruising drivers could give

²⁵ Darbéra (2007) 'when the regulator acknowledges the existence of two distinct markets for taxi services'

²⁶ Taxi drivers do compete with each other to some extent: talented or experienced drivers are better at predicting demand and therefore have higher utilisation rates. However, unlike a normal industry where a small competitive advantage (for example cost advantage) could be scaled up to grab significant market share from inefficient competitors, it is difficult for individual drivers to scale up his or her talents and experience.

the particular taxi monopoly power over the consumer, which could lead to monopoly pricing, even in markets where there are many suppliers. The 'first come, first serve' custom at taxi ranks also prevents fare negotiation in general. It is normally accepted that the maximum regulated fare level will be the fare level charged by taxi drivers in the street and rank hiring segment, since drivers cannot charge more than the maximum and have little incentive to charge less.²⁷

- 5.14 Action by an individual taxi driver to improve his offering could have a positive effect on consumers' perceptions of the offering of taxis as a whole but the individual would be unable to capture the full value of his additional investment because he is not able to exert any competitive advantage. Other drivers would have the same opportunity to pick up fares without having to make the same investment. As a result there is likely to be under-provision of such improved offerings i.e. less improvement in the quality of taxi service than is optimal. The lack of incentive for individual taxi drivers to improve their own offering (for example by lowering price or increasing service quality) reinforces the lack of competition on price or quality in the street and rank hiring segment.
- 5.15 These features of the street and rank hiring segment form part of the justification for the continuation of both fare and quality regulation which was accepted in the 2003 study

Pre-booking segment

- 5.16 The pre-booking segment is significantly different from the street and rank hiring segment. The most important difference is that the demand for each PHV operator is independent (in contrast to the interdependence of demand in the street and rank hiring segment). This is because consumers are probably more aware of the brand names of operators when they order PHV services, and each operator therefore has a greater

²⁷ This is not always true, as drivers tend to offer discount on long journeys (for example to airport). However, our assumption would hold in most taxi journeys hired on the street or at the rank.

incentive to compete on price, waiting time or other aspects of service quality.

- 5.17 Moreover, due to the telephone booking system, it is easier for consumers to shop around in the pre-booking segment for lower prices and better offerings. As a result, PHV operators have a greater incentive to lower price and/or waiting time to compete for business, especially that of repeat customers.

Summary

- 5.18 As discussed above, the taxi and PHV market at the moment can be segmented into two parts: street and rank hiring and pre-booking. The first segment exhibits particular features which limit the extent of competition which do not exist in the second. The two segments are closely linked, and the market outcomes such as quality-adjusted price in each segment would affect those in the other.
- 5.19 In our analysis, we have mainly focused on the street and rank hiring segment when quantifying the impact of de-restriction and the 2003 study. Nevertheless we also provide qualitative analysis of the impact on the pre-booking segment as well.
- 5.20 We have noted in section 3 that technological advances could potentially change the taxi and PHV market profoundly in the near future, blurring the boundaries between the taxis and PHVs, and between the two segments. This could open up new opportunities for competition. Therefore it is important to bear in mind that the impacts we endeavour to quantify may change in the future as a result of developments in technology.

Analysis of welfare effects

- 5.21 At a first glance, it would seem that quantity restriction would restrict the supply of taxi services, limit the choice of consumers, increase consumers' waiting time, and enable taxi drivers to enjoy 'monopoly rents' in the form of licence premium at the expense of consumers. However the impacts of quantity restriction (and therefore de-restriction)

on the taxi market, coupled with other regulations and a closely related pre-booking sector, are not as clear cut as one might expect.

- 5.22 One particularly complicating factor is the existence of fare regulation, which exists in most LAs. Our analysis (which is set out in more detail in Annexe 4) shows that in addition to the benefits that consumers could expect from de-restriction in the street and rank hiring sector, there would also be a cost to existing taxi drivers through an increase in their waiting time between journeys. This represents a reduction in productive efficiency. Taking both of these effects into account, it is possible for the net impact of de-restriction coupled with fare regulation to be either positive or negative.
- 5.23 Our review of taxi fare levels did not identify any difference in the changes in fare levels in still restricted areas and areas de-restricted since the 2003 study. Our analysis does not therefore include any allowance for effects on the demand or supply of taxi services in de-restricted areas stimulated by price changes. If de-restriction had been accompanied by reduction in the regulated price then this would have altered the balance between consumer benefits and reduced driver productivity.
- 5.24 This analysis highlights the complexity of the issues involved and the need for much more careful analysis than a simple presumption that free entry will always be beneficial. In addition there are also potential effects from interactions between the street and rank hiring sector and the pre-booking sector which are more difficult to quantify but which also need to be taken into account.
- 5.25 In summary, the welfare implications of de-restriction, with the existence of unchanged fare levels, remain uncertain because:
- In the street and rank hiring segment, there would be more taxi journeys after de-restriction and the price will remain the same. Consumers and new taxi drivers would benefit from de-restriction, while existing taxi drivers would face increased waiting times and a reduction in their productivity. The net impact in this segment is unclear.

- In the pre-booking segment, the market outcome is uncertain as it is unclear whether the price will be higher or lower after de-restriction, although there would be likely to be fewer pre-booked taxi journeys. The net impact in this segment is also unclear.

- 5.26 This theoretical uncertainty over the welfare impacts of de-restriction is consistent with the finding of the OXERA literature review (2003), which, as a specific example, cited Toner and Mackie (1992), which considered the impact of de-restriction. It found that, in the scenario where entry control was abolished but fares control was maintained at the current level, it led to an increase in consumer surplus, as taxi numbers increase substantially, but a reduction in overall welfare, as the same increase in taxi numbers led to cost increases.²⁸
- 5.27 Where de-restriction leads to excess entry and higher costs, then reduction in regulated price might be expected both to decrease cost per journey and increase consumer welfare.

Quantification of welfare impacts

Type of impacts to be quantified

- 5.28 Our analysis seeks to quantify a number of the impacts arising from de-restriction:
- consumer benefit from the reduction of waiting time on existing taxi journeys hired on streets or at taxi ranks
 - consumer benefit from switching between different hiring methods, and
 - reduced productive efficiency of existing taxi drivers.
- 5.29 Due to lack of data, we do not quantify the following impacts of de-restriction:

²⁸ Page 26, OXERA (2003) 'Taxi markets literature review', Annexe G of the 2003 study.

- gains or losses of existing consumers in the pre-booking segment
- gains or losses of existing PHV drivers in the pre-booking segment, and
- gains of new taxi drivers.

5.30 Since the changes in regulated prices in still restricted areas and areas de-restricted since the 2003 study have remained the same, we have not estimated any price effect on consumer welfare or productive efficiency.

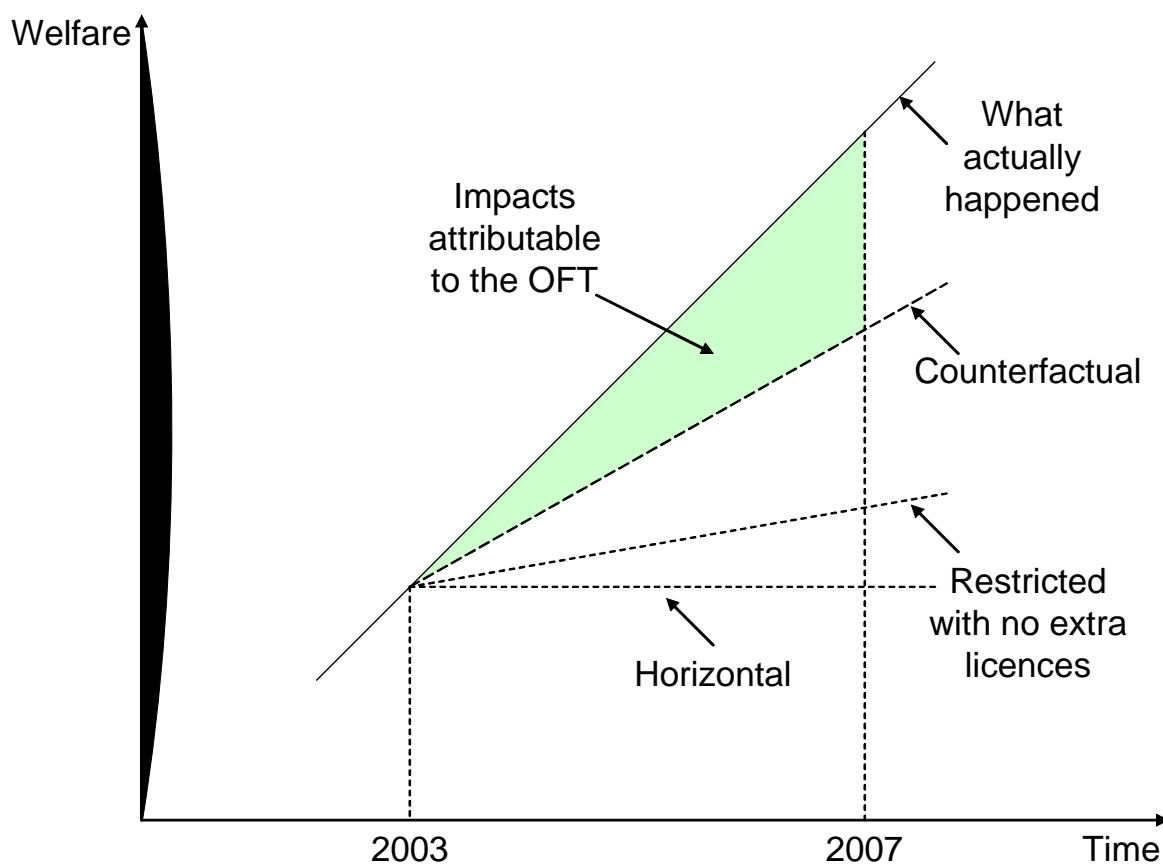
5.31 We present our main quantifications in Section 5, and Annexe 6 provides a detailed explanation of the underlying analysis.

Counterfactual

5.32 'Counterfactual' refers to the hypothetical world that would have resulted had the OFT not carried out the 2003 study. The differential between what has actually happened and what would have happened under the counterfactual are the impacts that are attributable to the 2003 study.

5.33 Chart 1 below illustrates the concept of counterfactuals for LAs which were de-restricted after 2003 and LAs which remained restricted. This sets out an example of a situation in which, even without the 2003 study there would have been some improvements both in those areas which remained restricted in 2007 and those areas which de-restricted. Any impact identified above these levels can then be attributed to the 2003 study.

Chart 1: Counterfactual for LAs De-restricted since 2003



Note: this chart is illustrative only

5.34 There are several notable factors, other than the 2003 study, which have affected either the de-restriction of the LAs or the supply/demand characteristics of the market. First, as explained in Section 2, the view of stakeholders is that the Licensing Act 2003 has had a significant impact on the demand for taxi services. It arguably smoothes the demand peaks around the previous fixed closure time of pubs and clubs, which should lead to a decrease of waiting time in these previous peak hours. This effect is common to both restricted and de-restricted areas and we would therefore expect there to have been benefits to consumers from shorter waiting times during those previous peak times even without the 2003 study.

5.35 Second, also as explained in Section 2, the uncertainties over the application of the Disability Discrimination Act affects the supply of taxi vehicles. Some LAs have required that all new taxi vehicles be

wheelchair accessible. This is likely to increase the cost of entry to the street and rank hiring segment of the market after de-restriction and could reduce the scale of entry. This could in turn reduce the impact of de-restriction on waiting time.

- 5.36 Third, not all de-restriction decisions were direct results of the 2003 study and related follow-on actions. Some stakeholders have suggested to us that there was a general trend towards de-restriction (for example the number of LAs which have de-restricted exceeded the number of LAs which have re-imposed restriction) before the 2003 study. This effect is illustrated in the rising welfare shown in the counterfactual line. Only changes above this level are taken should be taken as attributable to the 2003 study

Caveats on our conceptual framework

- 5.37 Although we believe the conceptual framework presented above is a reasonable guide to analysing the impact of the 2003 study, it is important to understand the caveats and limitations of this framework.
- 5.38 First of all, we only analyse the situations where markets are in equilibrium and do not cover the transition period. If the market takes significant time to settle down after de-restriction, then our conceptual framework may fail to capture some important features of the market during market correction.
- 5.39 Second, our conceptual framework is based on the current technology used in the taxi market and does not cover the dynamic effects of market development and technology advancement.
- 5.40 Third, we do not analyse the welfare impacts on the markets or parties outside the taxi market. For instance, our analysis does not cover the impact on buses or city centre congestion levels.

6 OVERALL ASSESSMENT

- 6.1 The programme of research outlined in Section 3 has brought together published information and new material from surveys and stakeholder interviews. We have used this material to estimate the impact of the 2003 study on consumers and the taxi sector more generally.
- 6.2 This section summarises the research findings and our analysis. Further details on the research are set out in Annexe 5 and on the analysis in Annexe 6.

Summary of key findings

Regulatory development in the taxi/PHV sector

- 6.3 More than half of the LAs in England and Wales were already de-restricted in 2003, and about one third of the remaining restricted LAs have de-restricted since 2003. The OFT's 2003 study and subsequent follow up actions along with threat of litigation (which may itself have been stimulated by the study) are regarded by these newly de-restricted LAs as important factors in their decisions on de-restriction.
- 6.4 Most LAs have tightened quality requirements on taxi vehicles. All of the LAs which have de-restricted since 2003 have done so.

Sector development in the taxi/PHV sector

Taxi numbers and fares

- 6.5 The total number of licensed taxi vehicles in England and Wales increased by slightly less than 10 per cent between 2002 and 2005. The number of licensed PHV vehicles exhibited a much higher growth rate. However, this is most likely due to the fact that the Transport for London only started to license PHV vehicles and drivers in London during this period.
- 6.6 The number of licensed taxi drivers in England and Wales increased by about 10 per cent between 2002 and 2005. The number of licensed

PHV drivers also exhibited a higher growth rate, most likely for the same reason as discussed above.

- 6.7 Most of the benefits to consumers of de-restriction outlined in the 2003 study have been realised in the newly de-restricted LAs.
- 6.8 Between 2003 and 2007, both in the LAs which were already de-restricted in 2003 and the LAs which de-restricted since 2003, the numbers of taxis have increased by around 30 per cent – the level of increase anticipated in the 2003 study. In contrast we found that the number of taxis in LAs which are still restricted had barely changed during the same period.
- 6.9 Among the three groups of LAs which we analysed over this period, the number of PHVs in still restricted areas has increased the most and that in newly de-restricted areas has increased the least. The newly de-restricted LAs had the highest PHV to taxi ratio in 2003 and this remains the case in 2007, although the gap has narrowed.
- 6.10 These observations may support the suggestion made to us by some stakeholders that, after de-restriction, existing PHV drivers are those most ready to take the opportunity to operate licensed taxis and this leads to a temporary reduction in the rate of growth in the PHV sector which is, at least in part, offset in later years.
- 6.11 The format of fare regulation has not changed significantly since 2003, although the level of the regulated maximum fares has increased significantly. The average regulated maximum two-mile fares in both England and Wales and Scotland have increased by about 50 per cent since 1999, and the fare changes in different regions exhibit very similar patterns. The degree of such increase was quite even across Britain and we have not identified any difference between restricted and de-restricted areas.
- 6.12 We believe from our discussions with stakeholders that the regulated maximum fare is the actual fare paid by most taxi journeys hired on streets or at taxi ranks. We have no data on the actual fares paid on taxi journeys pre-booked.

Waiting times

- 6.13 It is important to note that waiting time data points were very widely dispersed, and that the net welfare impact of de-restriction that they generate are statistically indistinguishable from zero at a 75% confidence level.
- 6.14 The average passenger waiting time has decreased substantially since 2003 in both restricted and de-restricted areas. This may, in part, be explained by the changes in alcohol and entertainment licensing hours introduced in 2005 which spread out the 'closing time' peak demand for taxis. However the reduction in waiting times has been greater in de-restricted areas. In our sample LAs, the average reduction in passenger waiting time for taxi journeys hired at taxi ranks was 0.13 minute, or 10 per cent of initial passenger waiting time per trip greater in de-restricted than in restricted areas.
- 6.15 At the same time driver waiting time has increased in both restricted and de-restricted areas with considerably larger increases in de-restricted areas. In our sample LAs the average increase in driver waiting time of taxi journeys hired at taxi ranks was 5.22 minutes, or 77 per cent of initial driver waiting time per trip more in de-restricted than in restricted areas. This increase in driver waiting time is significantly greater than the reduction in passenger waiting times.
- 6.16 There is no evidence from our case studies that late night waiting times have increased following de-restriction.

Consumer perceptions

- 6.17 Our case studies have found that, contrary to what many had expected, consumers' perceptions of the quality of taxi services in the newly de-restricted areas have largely remained unchanged. However, the number of consumer complaints in all de-restricted LAs (including those already de-restricted in 2003) has increased, which may partly reflect the increased taxi usage in de-restricted areas, while that in still restricted LAs largely remains the same.

- 6.18 Consumer perceptions on the change in the availability of taxis are mixed. In two areas (out of three in our sample) more consumers thought that availability had improved than thought it had worsened but in one area the opposite was reported.

Illegal taxis

- 6.19 We have not been able to obtain any data on either the usage of illegal taxis or illegal taxi related crime. However the increase in licensed taxis following de-restriction should reduce the opportunity for illegal taxis to operate with corresponding benefits to consumers. Enforcement is an important issue. A main concern of taxi operators, in addition to the operation of completely unlicensed vehicles, was with PHVs illegally plying for hire on the street, particularly late at night.

Comparison with the experiences in other jurisdictions

- 6.20 The experience in other jurisdictions where deregulation (of quantity only or of both quantity and price) took place has also provided some useful insights. However, due to the differences in regulatory framework and the way deregulations were implemented, the results in other jurisdictions are not fully comparable with what have happened in the UK.
- 6.21 First, as Kopp (2007) found, there is an important difference between the 'cruising market' (i.e. the street and rank hire segment by our definition) and the 'dispatch centre market' (i.e. the pre-booking segment by our definition) in terms of their need for regulations and their responses to de-restriction.
- 6.22 Second, some expected effects of de-restriction have taken place. For instance, in countries where entry has been deregulated, the number of taxis had generally increased significantly and the waiting times had substantially decreased.
- 6.23 Third, there is a need for quality regulation, as mass entry has also generally led to a decrease in quality of service. Kopp (2007) suggested

that there may be a danger of regulatory capture as the decrease in service quality has in some cases led to re-restriction.

- 6.24 In Ireland the devaluation of the licence in the aftermath of de-restriction became a political issue. The government issued compensation to licence holders, albeit based on their individual economic loss.

The impact of the 2003 study

Effects on consumer welfare and productive efficiency

- 6.25 As outlined in our conceptual framework, the impacts of de-restriction can be divided between effects on consumers which are expected to be positive and impacts on the suppliers of taxi services. The effects on the supply side are complex and difficult to quantify but can potentially be negative. Overall therefore the total impact of de-restriction on economic welfare is ambiguous and could be either positive or negative.
- 6.26 We have estimated two elements of consumer benefit from de-regulation in the street and rank hiring segment. First the observed reductions in waiting time have been combined with values of time published by DfT to give estimated annual savings across all of the LAs that have de-restricted since 2003 of between £1 million and £3.5 million. We have also used the same approach to provide an estimate of the potential consumer benefit which might be obtained if de-restriction was extended to those areas which continue to operate quantity restriction. That annual potential is in the range £2 million to £10 million.
- 6.27 The second element in consumer benefit comes from additional taxi journeys as a result of the improved service following de-restriction. For this we have estimated the increase in utility or value to customers of the taxi service less the additional price compared with a pre-booked car. Details of the calculation are set out in Annexe 6. The annual benefit in de-restricted areas is estimated to be around £1 million with a corresponding further potential benefit of around £3 million in areas that currently remain restricted.

- 6.28 Taking these two elements together, the effect in the 48 LAs that have de-restricted since 2003 has been annual consumer benefits in the street and rank hiring segment ranging from about £2 million to £5 million, depending on assumptions. The potential for further consumer benefits in the areas that remain restricted are in the range £5 million to £13 million per year.
- 6.29 We have also estimated the additional cost of providing taxi services in de-restricted areas resulting from the additional driver waiting times that we have observed. We have adopted two alternative approaches. First we have estimated the additional cost to existing taxi drivers based on the elimination of the licence premium. This suggests an annual cost increase in productive efficiency per taxi of around £3,000. Grossed up over the number of taxis prior to de-restriction, this gives an estimated increase in costs of £15 million. An alternative approach is based on the observed waiting times valued either at the same values as we have used for passenger waiting or at the value of the minimum wage. This gives increased costs in the range £12 million to £31 million.
- 6.30 The net loss in productive efficiency of the market taking into account both the increase in costs and the improved quality of service resulting from the reduced passenger waiting time is therefore between £8 million and £29 million per year.
- 6.31 This is consistent with the findings of the OXERA literature review (2003). Previous studies had found that where entry control was abolished but fares control was maintained at the existing level, this led to an increase in consumer surplus but a reduction in overall welfare, as the increase in taxi numbers led to cost increases.²⁹
- 6.32 The continuation of fare regulation at the pre-de-restriction level is an important factor in creating this efficiency loss. Fare rigidity encourages drivers to remain in the taxi sector and accept the longer waiting times while reducing the number of new consumers entering the market.

²⁹ Page 19, OXERA (2003) 'Taxi markets literature review', Annexe G of the 2003 study.

6.33 In addition to the welfare effects estimated above, there are other impacts of de-restriction that we have not been able to quantify due to limited data availability. Other impacts which should be taken into account include:

- welfare gain or loss of existing consumers in the pre-booking segment
- welfare gain or loss of existing PHV drivers in the pre-booking segment, and
- welfare gain of taxi drivers from additional taxi journeys.
- benefits to consumers from reduced use of illegal unlicensed taxis.

6.34 Therefore we cannot draw a firm conclusion on either the magnitude or the sign of the net impact of de-restriction in the 48 LAs which have de-restricted since 2003. Even where estimation has been possible this has been on the basis of a limited number of observations (4 de-restricted LAs and 7 restricted LAs). As mentioned before, the small size of the data sample and the considerable dispersion of results mean that some of the key inputs into the impact estimations are statistically indistinguishable from zero at a 75 per cent confidence level. Our estimates provide an initial view on two particular impacts of de-restriction and, in our view, provide a plausible range of values for these effects but they do not, and are not intended to, provide a complete picture of the impact of de-regulation.

Attribution to the 2003 study

6.35 Finally we have considered the extent to which the effects outlined above can be attributed to the OFT study. Our approach to the counterfactual of what might have happened in the absence of the 2003 study is set out in more detail in Annexe 4. It is our view that some benefits would have occurred even without the study. There has for some years been a trend towards de-restriction which would have continued. There were also external factors, particularly the implementation in 2005 of the Licensing Act 2003, which we have taken into account in comparing restricted and de-restricted areas.

Nonetheless, our survey of LAs showed that the OFT study and the related follow on actions were important factors in the decision to move to de-restriction.

- 6.36 Overall our view is that the 2003 study was an important but not the only factor leading to further de-restriction. We cannot make a precise attribution of influence but, in our view, it would be reasonable to attribute between half and three quarters of the welfare effects to the 2003 study.

Comments on the 2003 study

- 6.37 The 2003 study provided a detailed and well informed review of the market for taxi services. Its recommendations and the follow on actions have, as indicated above, been influential in encouraging further de-regulation which has resulted, as the report anticipated, in an increase in taxi numbers and a reduction in customer waiting time.
- 6.38 We have estimated the value to consumers of these reduced waiting times and a corresponding further potential benefit if de-restriction was extended across the whole market. There was no explicit valuation of this benefit in the 2003 study. In addition we have estimated a loss in productive efficiency associated with the increase in driver waiting time following de-restriction. This effect was not addressed in the 2003 study.
- 6.39 In carrying out this Review we have identified some further aspects of the work which might have been approached differently and from which we have drawn lessons to be taken into account in future market studies.
- 6.40 In our assessment of consumer benefit resulting from the 2003 study we have been very conscious of the complex interactions involved in the market for taxi services. The nature of the street and rank hiring segment involves externalities which affect consumers and which justify some continuing regulation. Different factors operate in the pre-booking segment which is subject to much lighter regulation. The way in which competition takes place, both within and between segments, is

something we have sought to take into account in assessing the impact of changes in regulation.

- 6.41 This complexity was acknowledged in background work for the 2003 study (see for example the comments in the literature review carried out by OXERA) but was not given prominence in the main findings and recommendations. The description of the market, for example, provides information on the scale of the taxi and PHV services and of the different regulatory regimes but does not consider interactions between the two types of service or the factors affecting consumers' choice between them
- 6.42 In our view a more detailed analysis of different elements in the market would have given the OFT a better understanding of the welfare implications of the changes it proposed and would have enabled it to provide an estimate, albeit subject to qualifications, of the value of consumer and other benefits or detriments. The absence of such an estimate is an omission from the 2003 study.
- 6.43 Particular issues which we consider could have been subject to more detailed scrutiny include:
- the segmentation of the market between ply-for-hire (involving taxis only) and telephone bookings (involving both PHVs and taxis) and between urban and rural areas
 - the distinction between the supply of taxi services and the numbers of taxis, particularly the way in which de-restriction may increase the number of taxis but reduce the number of journeyman drivers
 - the way in which continuing fare regulation for taxis at previous levels may reduce the benefits of de-restriction of taxi numbers and may also limit the ability of both consumers and drivers to provide a trade-off between price and quality of service, and
 - the effects of de-restriction both in creating losers as well as winners and possible short-term disruption while markets adjust, for example, over-supply of new taxis leading to town centre congestion and additional emissions.

6.44 This more detailed scrutiny would have allowed the OFT to present a fuller picture of the operation of the market and to assess the welfare implications of possible changes. This would have added to the credibility of its findings and recommendations and would have provided a stronger basis for responding to criticisms of the study.

Lessons for future market studies

6.45 Provision of taxi services is unusual both in the way in which the market interactions take place and in the extent of regulatory intervention. As such it may not be typical of the types of activity likely to be the subject of an OFT market study. Nonetheless we consider that there are some general lessons for future market studies which can be drawn from the comments we have made on the 2003 study.

6.46 First, in order to provide a focus for analysis we suggest that each market study should start with a clear statement of how the relevant market has been defined including a review of potential substitute products. The OFT's own paper 'Market definition – Understanding competition law' provides a good starting point for such a statement.³⁰

6.47 Second, as noted in our earlier review of the Car Warranties Market Study,³¹ before making recommendations for change each market study should include an assessment of the consumer detriment arising from the status quo and the benefit to be expected from change.

6.48 Third, when making recommendations related to regulated sectors the OFT should take account of interactions between different regulations, particularly in cases where a partial deregulation is being recommended. Particular attention should be paid to the impact of continued price regulation in situations where other forms of regulation are being relaxed.

³⁰ OFT (2004) 'Market definition – Understanding competition law'
www.offt.gov.uk/advice_and_resources/publications/guidance/competition-act/oft403

³¹ Europe Economics (2006) 'Evaluating the impact of the car warranty market study'
www.offt.gov.uk/shared_offt/about_offt/oft852.pdf

6.49 Finally, although the OFT's principal focus is on how markets are working for consumers it should also take into account the wider welfare effects of any proposed changes. Where changes may create significant losses to the producers of goods or services, not related to the exercise of market power, this may increase resistance to change and act as an obstacle to beneficial longer term developments. Consideration of transitional arrangements may be necessary.

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B LA SURVEY QUESTIONNAIRE

In 2003 the Office of Fair Trading (OFT) undertook a market study to examine the regulatory framework affecting licensed taxis and private hire vehicles (PHVs). The OFT has commissioned an independent evaluation of the effects of that study. The evaluation is being carried out by Europe Economics and Halcrow. This survey forms an important part of the review and has been sent to all licensing officers in England, Wales and Scotland.

1. Name of your Authority?

Type of Authority

Unitary 1
Other 2

Local Authorities can control entry to the hackney carriage market by imposing a numerical limit on the number of hackney carriage vehicle licences.

2. Does your authority currently limit the number of hackney carriage vehicle licences?

Yes 1
Yes but with an annual increase 2
No 3

3. Has your authority changed its policy on hackney carriage vehicle entry control since 2003?

Yes 1
No 2

If Yes please indicate the nature of the policy change(s) by ticking which one applies below. Please indicate the year of each policy change. Include any proposed policy changes that will be implemented in 2007.

		Year
Re introduced entry control to the hackney market i.e. re-restricted	1	_____
Retained entry control but introduced an annual increase	2	_____
Removed entry control from the hackney market i.e. de restricted	3	_____
Removed and then re-instated entry control to the hackney market	4	_____

4. Has your authority changed its policy on hackney carriage vehicle age/quality/type since 2003? (please tick all that apply and indicate the year of each policy change)

Tightened hackney vehicle age/quality conditions	1	_____
Tightened hackney vehicle type conditions (e.g. to allow wheelchair accessible vehicles only)	2	_____
Relaxed hackney vehicle type conditions	3	_____
Relaxed hackney vehicle age/quality conditions	4	_____
Other (please specify) _____	5	_____

5. How many vehicles were licensed in your area in each of the following years? Please complete as fully as your records allow.

Year (as at 31 st March)	Hackney Carriages			Private Hire Vehicles		
	Wheelchair accessible	Other	Total	Wheelchair accessible	Other	Total
2007						
2006						
2005						
2004						
2003						
2002						
2001						

6. Does your authority have a waiting list for people that would like a hackney carriage vehicle licence?
 Yes 1
 No 2

If yes how many people are on the list?

7. Thinking about hackney carriage vehicle entry control policy and vehicle age/type policy, what have been the most important influences on your authority's policies in the period since 2003? Please identify the top 3 factors from the list below using a '1' to denote the most important, a '2' to denote the second most important and a '3' to denote the third most important. Leave the remaining rows blank.

	Entry Control	Veh Policy
Representations from the hackney trade	___	___
Representations from the private hire trade	___	___
Representations from other interest groups	___	___
Other local political factors (e.g. change of political control/ policies)	___	___
The threat or result of litigation	___	___
Funding	___	___
The Disability Discrimination Act	___	___
The OFT 2003 <i>Taxis</i> report	___	___
The DfT's response to the OFT 2003 <i>Taxis</i> report (e.g. the letter of June 2004)	___	___
DfT Guidance published in November 2006.	___	___

8. If known, what is the best estimate of a hackney vehicle plate value in your area (over and above the value of the taxi vehicle itself)? Please provide your best estimate based on whatever information is available to you. If you are really unsure please place an 'E' after the amount e.g. £10,000E. You don't need to allow for inflation when estimating for 2003.

Please provide figures for 2003 and 2007.

2003 £ 2007 £

If this value has changed significantly, what do you think is the reason for this?

9. Does your authority monitor complaints about the hackney carriage trade?

- Yes 1
- No 2 go to Q11

If yes would you say that complaints have increased, decreased or stayed the same since 2003?

- Increased 1
- Decreased 2
- No change 3
- Don't know 4

10. What is the nature of these complaints? Please rank in terms of quantity of complaints with 1 being the most complaints received and 5 being the least.

- Fares -----
- Vehicle Quality -----
- Driver Quality -----
- Availability of hackneys -----
- Other (please state) -----

11. On a scale of 1 to 10 how influential would you say that the 2003 OFT Taxis study has been in influencing hackney carriage licensing policy in your authority? (10= highest level of influence, 1=lowest level).

Many Thanks for your contribution

The Department for Transport (DfT) will be carrying out its own regular survey of taxi and PHV licensing later this year. We would like to share the factual information you have provided (the answers to questions 1 - 6 and 8-11 with DfT in order to get full value out of both surveys. If you do not wish the information you have provided here to be shared with DfT please indicate in the box below.

I do not wish this data to be shared with the DfT

C LIST OF ORGANISATIONS INTERVIEWED

- C.1 Allied Vehicles
- C.2 Department for Transport
- C.3 Institute of Licensing
- C.4 Licensed Private Hire Car Association
- C.5 Licensed Taxi Driver Association
- C.6 National Association of Taxi and Private Hire Licensing and Enforcement Officers
- C.7 National Consumer Council
- C.8 National Private Hire Association
- C.9 National Taxi Association
- C.10 Public Carriage Office
- C.11 Scottish Consumer Council
- C.12 Scottish Executive Transport
- C.13 Scottish Taxi Federation
- C.14 Transport and General Workers Union
- C.15 Transport and General Workers Union Region 6
- C.16 Welsh Consumer Council

D THEORETICAL ANALYSIS OF THE WELFARE IMPACTS OF DE-RESTRICTION

Theoretical analysis of the welfare impacts of de-restriction under fare regulation

- D.1 At a first glance, it would seem that quantity restriction would restrict the supply of taxi services, limit the choice of consumers, increase consumers' waiting time, and enable taxi drivers to enjoy 'monopoly rents' in the form of licence premium at the expense of consumers. However the impacts of restriction (and therefore de-restriction), especially coupled with other regulations, on the taxi market are not as clear cut as one might expect.
- D.2 One particular complicating factor is the existence of fare regulation, a feature that characterises the taxi market in most LAs in the UK. Our analysis below shows that theoretically it is possible for the net impact on total welfare of de-restriction coupled with unchanged fare regulation to be either positive or negative.
- D.3 This by no means suggests that the 2003 study's recommendation is wrong or doing more harm than good – only empirical evidence could tell whether the net welfare impacts attributable to the OFT is positive or negative. We present our findings on this in Section 5 and provide detailed explanations on our calculations in Annexe 6. However, it shows the complexity of the issues involved and the need for much more careful analysis than a simple presumption that free entry will always be beneficial.

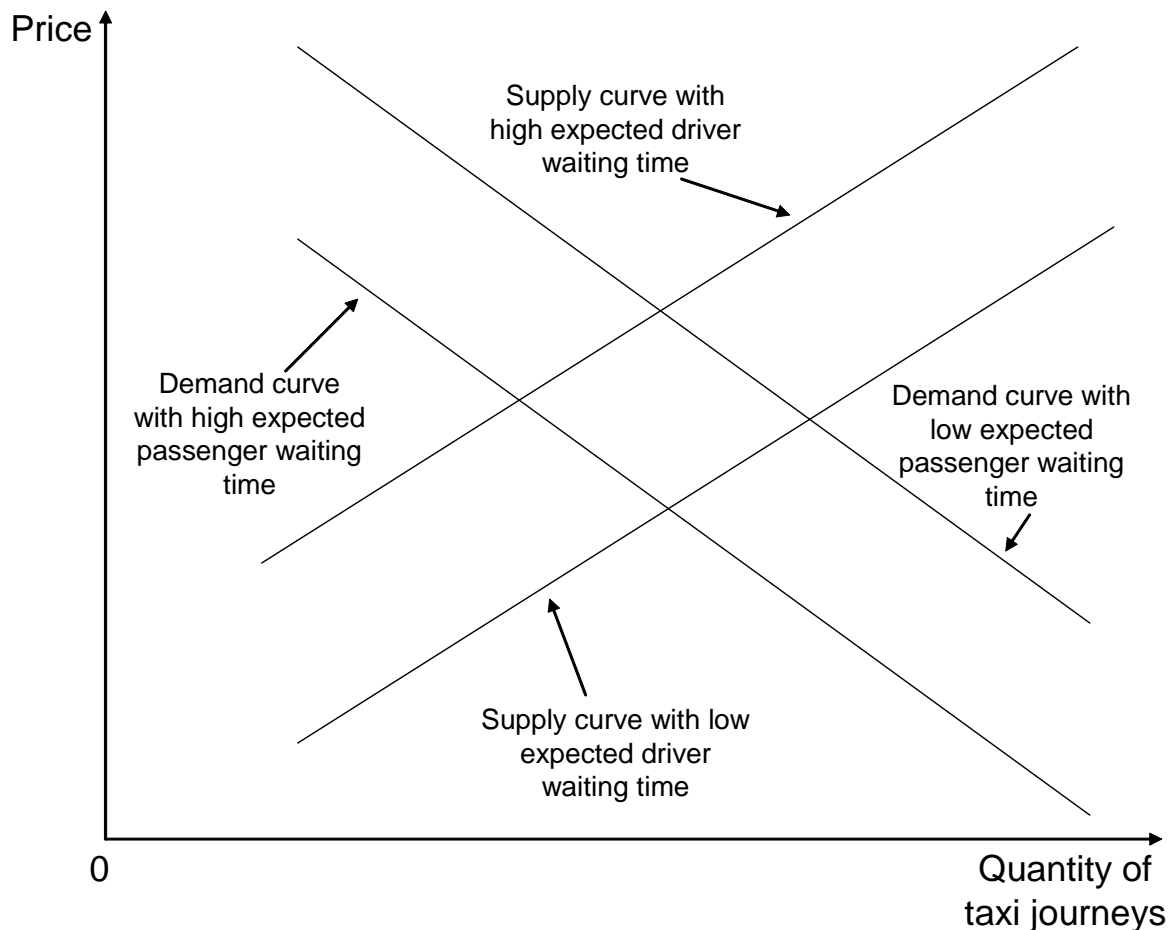
Demand for and supply of taxi journeys

- D.4 The demand curve (D) for taxi journeys reflects the consumers' willingness to pay for a taxi journey, *given certain expected passenger waiting time per trip*. In other words, different levels of expected passenger waiting time would lead to different demand curves, as shown in Chart A4.1. The supply curve (S) of taxi journeys reflects the taxi drivers' cost to supply taxi journeys, again *given certain expected driver waiting time per trip*. Similarly, also as shown in Chart A4.1,

different supply curves correspond to different levels of expected driver waiting time.

D.5 Chart A4.1 could be seen as either the street and rank hiring segment or the pre-booking segment.

Chart A4.1: Demand for and Supply of Taxi Journeys



Note: this chart is illustrative only

D.6 It can be seen from the chart above, once expected passenger waiting time increases, consumers' willingness to pay for a taxi journey will decrease as the taxi journey is now less attractive to consumers, therefore the demand curve moves downwards (or inwards). For the same reason, the supply curve moves upward (or outward) once expected driver waiting time increases.

- D.7 Note there is an interaction between the supply and demand curves: for any amount of quantity of taxi journeys, any reduction of passenger waiting time (i.e. an upward shift of demand curve) would lead to an increase of driver waiting time (i.e. a downward shift of supply curve), and vice versa.

Market equilibrium before and after de-restriction with the existence of fare regulation

- D.8 The street and rank hiring segment is subject to both fare and quantity restrictions, while the pre-booking segment is subject to neither. Therefore we treat these two segments separately.
- D.9 However, it is important to note that to treat them separately does not mean ignoring the link between the two segments – in our analysis, the links between these two segments are reflected in the demand and supply curves of taxi journeys. This is because any demand or supply curve is based on the assumption that any determinants of demand such as income, taste, preference, and price or quality of substitute goods is held constant. Any changes in the equilibrium outcome in one taxi market segment will affect the demand and supply curves in another segment. For instance, if the equilibrium passenger waiting time in the pre-booking segment decreases, this will make hiring a taxi on streets or at taxi ranks less appealing and lead to a downward shift of demand curve in the street and rank hiring segment.

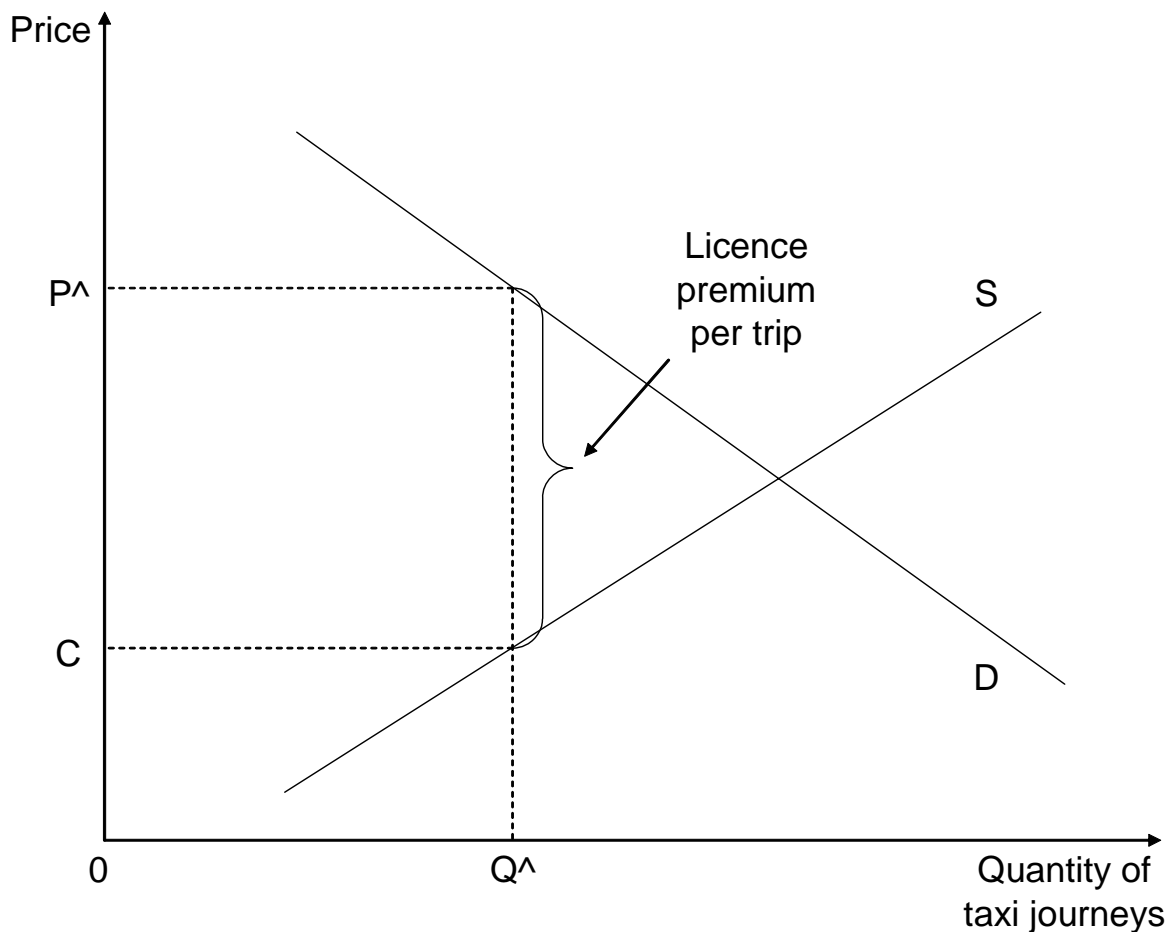
Street and rank hiring segment

- D.10 Quantity restriction only limits the number of taxi vehicles, therefore it does not impose a *single and unchanged* limit on the number of taxi journeys that could be provided – the resulted maximum number of taxi

journeys that could be provided depends on both the number of taxi vehicles and the utilisation rate of taxi vehicles (as reflected in driver waiting time).³²

D.11 Chart A4.2 below shows the market equilibrium under quantity restriction and fare regulation.

Chart A4.2: Market equilibrium under quantity restriction in the street and rank hiring segment

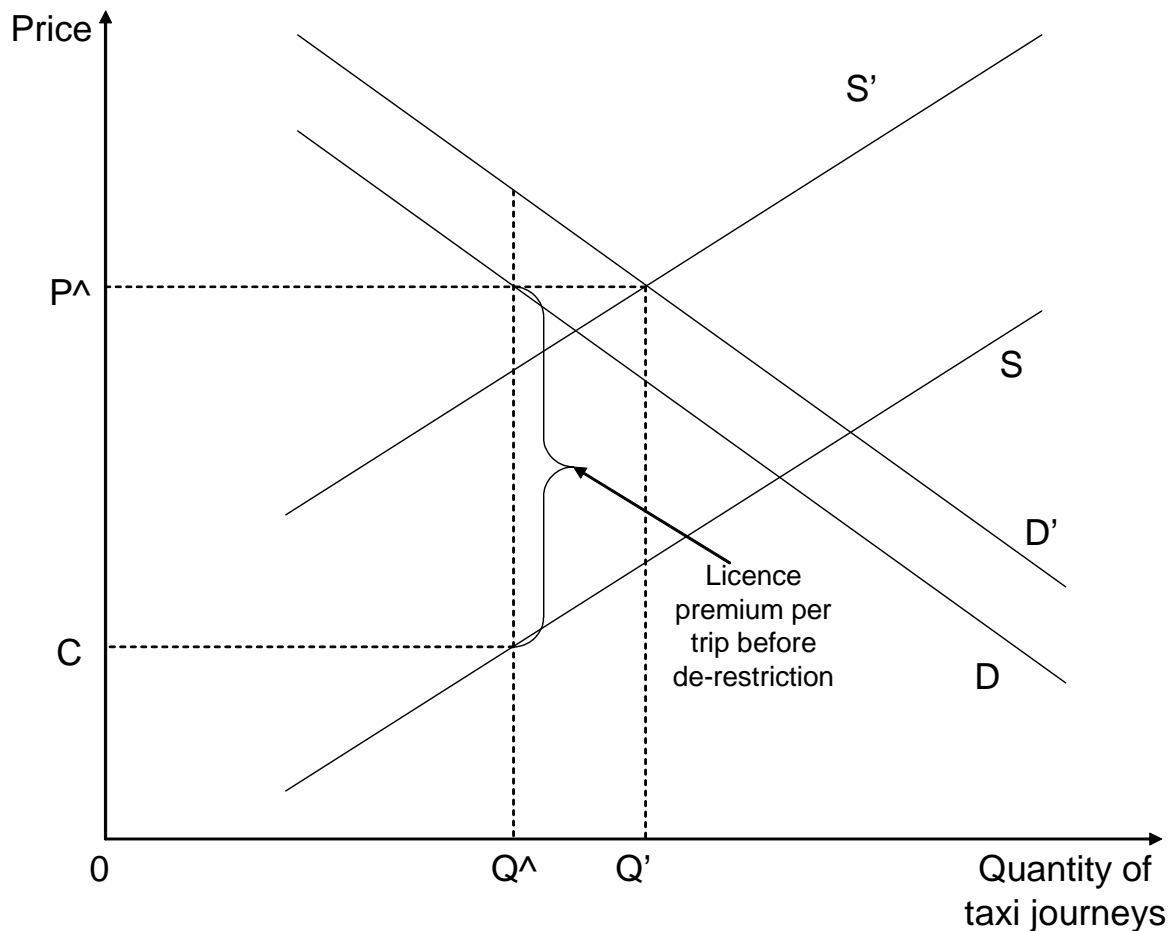


Note: this chart is illustrative only

³² It could be argued that there is an absolute limit on the number of taxi journeys that could be provided: if every taxi is operated 24 hours per day 7 days per week and has full utilisation rate (for example a taxi does not need to wait for passengers), the number of taxi journeys could be provided is limited. However, it's unlikely that this scenario could be realised in practice.

- D.12 P^{\wedge} is the regulated fare and Q^{\wedge} is the maximum number of taxi journeys available, given the quantity restriction. D and S are the demand and supply curve given the waiting time of passengers and drivers in equilibrium, respectively. Moreover, the difference between P^{\wedge} and marginal cost of providing a taxi journey (including driver waiting time) C is the licence premium per trip.
- D.13 It is interesting to note that, in equilibrium, the consumers' willingness to pay for the marginal taxi journey at Q^{\wedge} equals P^{\wedge} . This is because, due to the randomness of the distribution of supply and demand, if there is any unmet demand, then consumers with unmet demand will have an incentive to wait for a taxi, because the expected payoff (for example consumers' willingness to pay given the waiting time in equilibrium) would be higher than the cost.
- D.14 However, this does not imply that the regulated fare level is set at the 'correct' level, because when price is regulated, the market will adjust the quality (for example by increasing passenger waiting time) of the products offered to reach equilibrium.
- D.15 Now assume the quantity restriction is removed, therefore there is no longer an upper limit on the number of taxi services that could be provided. Chart A4.3 below shows that market equilibrium after de-restriction with unchanged fare regulation.

Chart A4.3: Market equilibrium after de-restriction in the street and rank hiring segment



Note: this chart is illustrative only

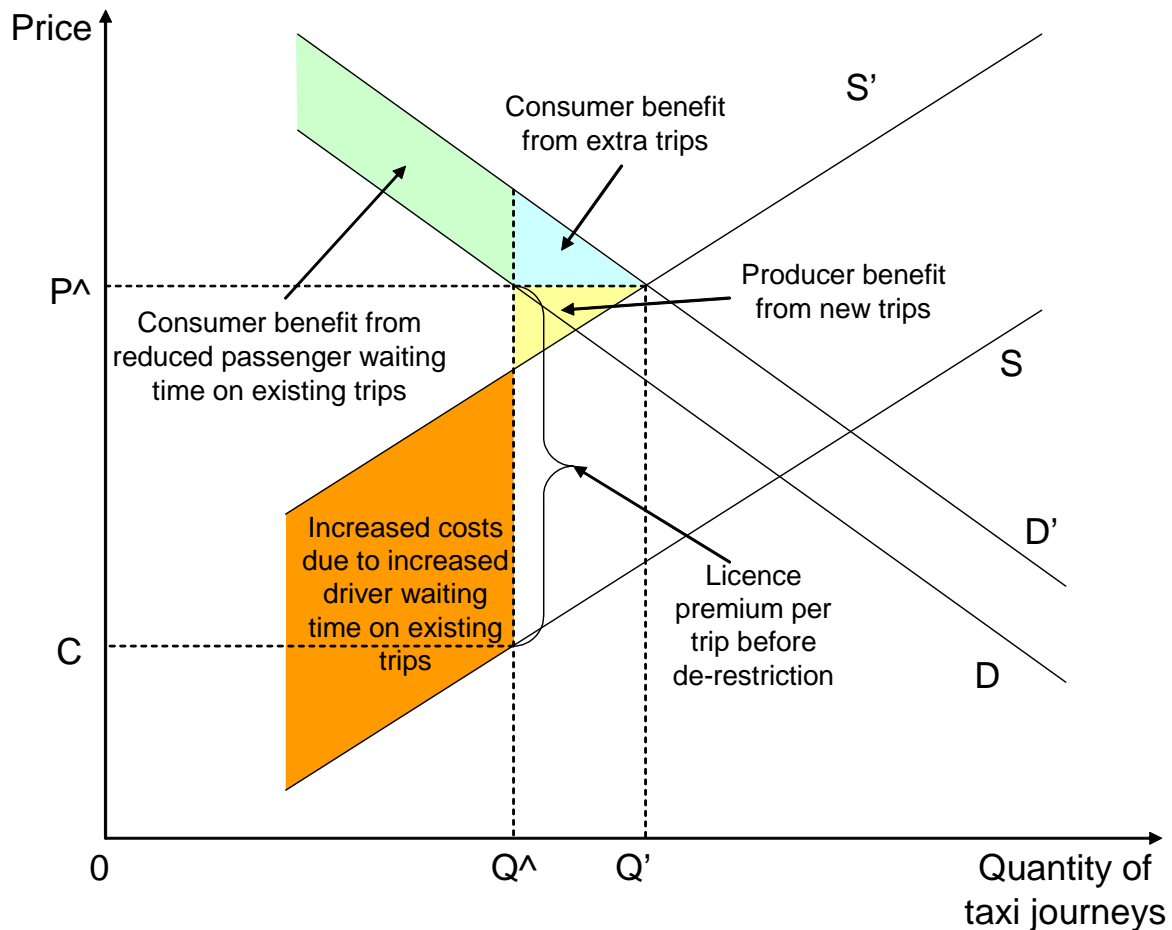
D.16 After de-restriction, more taxis³³ will enter the market and as a result passenger waiting time will be reduced, thus consumers will be willing to pay more for a taxi trip which is more attractive and as a result the demand curve will move upward from D to D'. However, the increase in demand does not match the increase of supply,³⁴ which means driver waiting time will increase. Therefore it will be more costly to supply taxi journeys, including the existing taxi journeys, which corresponds to an

³³ The new taxi drivers could be previous journeyman taxi drivers, previous PHV drivers, or people working in other occupations or unemployed.

³⁴ Because consumers' demand with respect to waiting time is inelastic (for example the absolute value of elasticity is less than one), demand will expand less quickly than supply.

upward *shift of* the supply curve.³⁵ Finally the market equilibrates when the new demand and supply curves D' and S' intersect at Q' and P^\wedge , and there is no longer any licence premium. In equilibrium, the marginal cost per taxi journey equals the marginal revenue P^\wedge .

Chart A4.4: Market equilibrium after de-restriction in the street and rank hiring segment

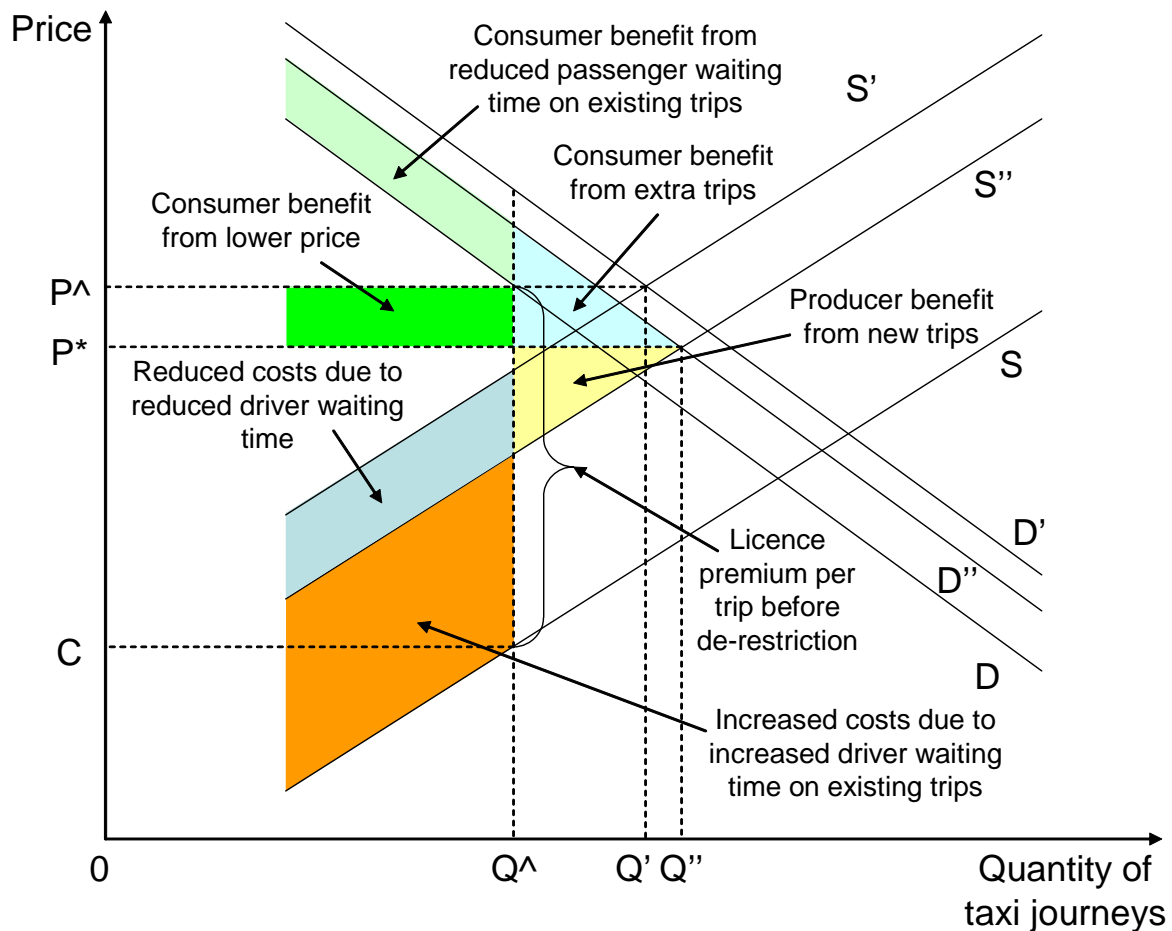


Note: this chart is illustrative only

³⁵ Some may argue that under quantity restriction, the actual taxi drivers may not be the most efficient drivers. So when de-restriction takes place, supply curve will experience a downward shift due to the entrance of more efficient drivers. One could reject this argument based on the existence of licence premium, which implies that the re-sale of licences does take place in restricted LAs, and this would lead to the efficient allocation of existing licences because the most efficient drivers would be able to over-bid others. However, given that the sales of taxi vehicle licences is a grey area and is illegal in some LAs, efficient allocation of licences may not be achieved.

- D.17 Chart A4.4 above shows the welfare impacts of de-restriction without a change in the regulated price. The green, blue, and yellow areas are various consumer and producer benefits arising from the reduction in passenger waiting time on existing taxi journeys and the appearance of additional taxi journeys. The brown area represents the loss in productive efficiency arising from increased driver waiting time on existing taxi journeys.
- D.18 The net welfare impacts of de-restriction in the street and rank hiring segment thus depends on whether the loss from increased driver waiting time on existing taxi journeys could be offset by various consumer and producer benefits. Please note that this chart is illustrative only and does not give information on the relative magnitude of each impact.
- D.19 It is also interesting to see how the net welfare impacts will change when the regulated fares are lowered.

Chart A4.5: Market equilibrium after de-restriction in the street and rank hiring segment when regulated fare level is reduced



Note: this chart is illustrative only

D.20 If the regulated price is lowered from P^{\wedge} to P^* after de-restriction, some taxis will leave the market. As a result, driver waiting time will decrease and passenger waiting time will increase. Therefore both the supply and demand curves will move downwards from S' and D' (as shown in Chart A4.4) to S'' and D'' as shown in Chart A4.5 above.

D.21 Compared with the situation where de-restriction is coupled with no change in the regulated fare level as analysed above, we can see that the increase in driver costs due to increased driver waiting time has been mitigated, as shown in the grey area in Chart A4.5. Moreover, consumers also benefit from lowered price. However, due to increased consumer waiting time, the increase in consumer benefit arising from reduced passenger waiting time has also been partly reversed.

D.22 Theoretically it is difficult to know whether the net welfare impact will be positive or negative. However, it seems that the net welfare impact of de-restriction coupled with lowering price will be smaller than but in the same direction with that of de-restriction coupled with no price change. The outcome would need to be tested empirically. It is possible that where de-restriction leads to excess entry and higher costs, then reduction in regulated price could lead both to decreased cost per journey and increased consumer welfare.

Pre-booking segment

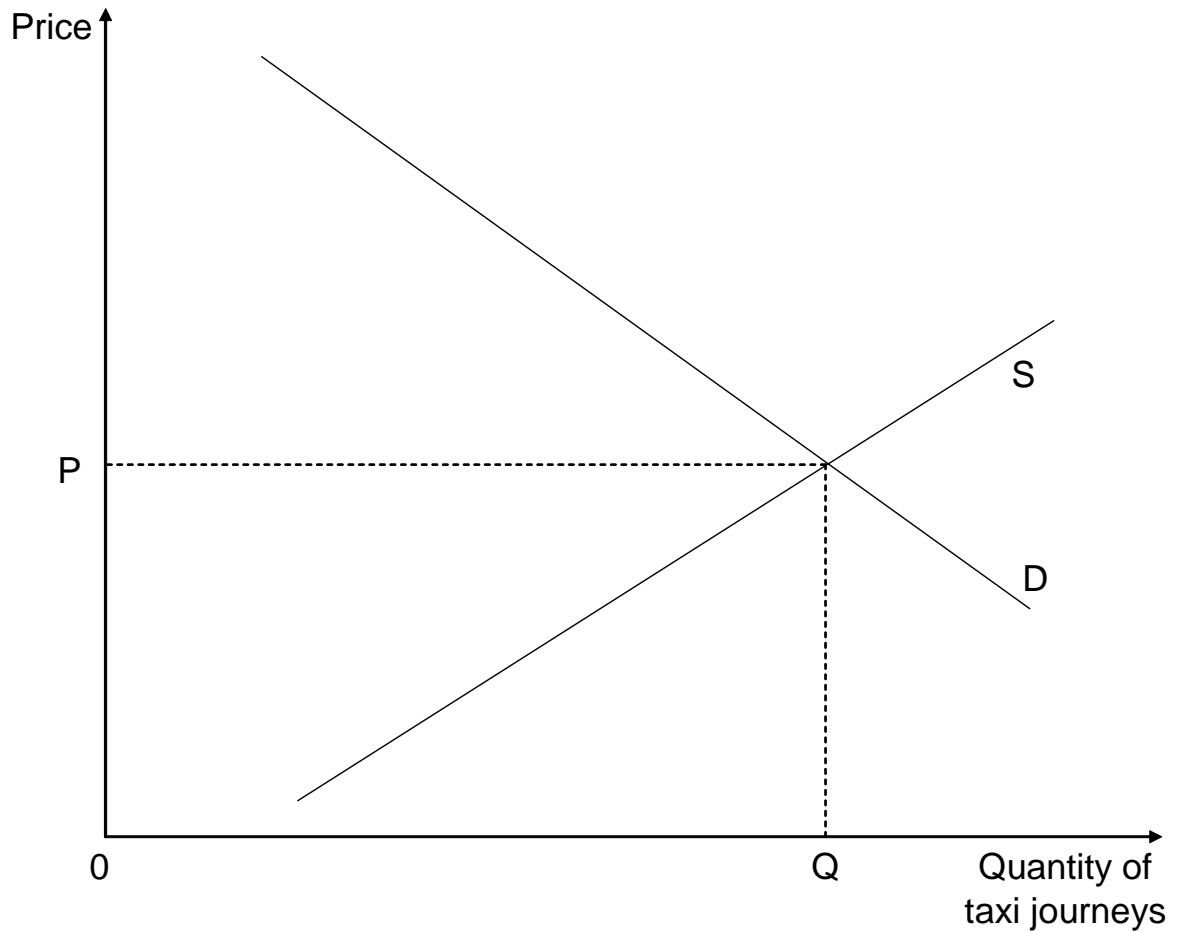
D.23 As explained above, an important feature of the pre-booking segment is that consumers can choose which operators to call and can negotiate on fares. This means PHV operators and taxi radio circuits operating in the pre-booking segments do have incentive to lower price to compete for business. Moreover, unlike the situation in the street and rank hiring segment where a consumer's expected passenger waiting time for his or her next trip does not depend on which taxi he or she would actually use (which means individual taxis in the street and rank hiring segment cannot differentiate on the passenger waiting time of their services), consumers in the pre-booking segment are able to be informed on the expected passenger waiting time of any particular PHV operator. Anecdotal evidence suggested PHV operators are able to differentiate on the passenger waiting time of their services by changing the capacities and utilisation rates of their fleets.

D.24 Therefore PHV operators and taxi radio circuits operating in the pre-booking segments are free to set both the price (although regulated fare in the street and rank hiring segment imposes an upper bound) and the quality (for example passenger waiting time) of their offering. This means they can trade-off between price and quality, which contrasts to the situation in the street and rank hiring segment where individual taxis have to accept the regulated price and could only adjust the quality (for example passenger waiting time) when de-restriction takes place.

D.25 Therefore the pre-booking segment does not exhibit the main market imperfections as observed in the street and rank hiring segment. Chart

A4.6 below shows the market equilibrium of the pre-booking segment when the number of taxis is still restricted.

Chart A4.6: Market equilibrium in the pre-booking segment when taxis are under quantity restriction



Note: this chart is illustrative only

- D.26 This is similar to the equilibrium of other normal markets, and there is no profit for the marginal taxi journey. Also the demand and supply curves are based on the equilibrium passenger and driver waiting times.³⁶
- D.27 After the de-restriction of taxis, some existing PHV drivers may move into the street and rank hiring segment to take advantage of the positive profit represented by previous licence premium per trip, and this could lead to two opposite effects on the supply curve in the pre-booking segment:³⁷
- the supply curve could shift upwards, since there are fewer PHV drivers, and
 - the supply curve could shift downwards, since fewer PHV drivers means lower driver waiting time.
- D.28 Because the second effect is caused by the first one, it's likely that the first effect will dominate the second, and the new supply curve S' , when in equilibrium, will be above the original one S .
- D.29 The demand curve will shift downwards, since:
- passenger waiting time in the street and rank hiring segment is reduced, which decreases the attractiveness of pre-booking and thus consumers' willingness to pay, and
 - fewer suppliers in the pre-booking market means higher passenger waiting time in this segment, which further decreases the

³⁶ Please note that most likely that, in equilibrium, different PHV operators will offer different passenger and driver waiting times and also different prices, because the efficient trade-off between price and quality may be different for each operator. However, quality-adjusted price offered by each operator should be the same, which is the P in Chart 4.5. Otherwise consumers will switch to the operator charging lowest quality-adjusted price and market cannot be in equilibrium in that case.

³⁷ Please note that the two market segments will move into equilibrium simultaneously, and there are feedbacks between the two segments on both directions. We illustrate as if one segment equilibrates first only for simplicity.

attractiveness of pre-booking and thus consumers' willingness to pay.

D.30 The new demand curve D' will be below the original one D.

D.31 This leads to three possible scenarios of (quality adjusted) price and quantity of taxi journeys in the pre-booking segment:

- Scenario 1: the upward shift of supply curve is bigger than the downward shift of demand curve, therefore in the new equilibrium the price is higher and the quantity is lower
- Scenario 2: the upward shift of supply curve is smaller than the downward shift of demand curve, therefore in the new equilibrium both the price and the quantity are lower, and
- Scenario 3: the upward shift of supply curve is the same as the downward shift of demand curve, therefore in the new equilibrium the quantity is lower but the price remains the same.

D.32 Due to the uncertainties over the market outcome in equilibrium in the pre-booking segment, the welfare impacts of de-restriction on this segment remains uncertain.

E KEY FINDINGS

E.1 In this section we present our main findings in this study, focusing on the following areas:

- the taxi and PHV sector in the UK
- regulatory development since the 2003 study
- changes in market outcomes, and
- experience of de-restriction in other jurisdictions.

The taxi and PHV sector in the UK

E.2 It is difficult to put an exact value on the annual taxi and PHV market turnover, primarily because many taxi drivers are self-employed and do not provide publicly available returns on their income. The 2003 study suggested that UK household spending on taxis in 2002 was £2.2 billion.³⁸ Another estimate, which examines operating companies alone, suggests that the UK taxi and PHV market is worth £1.9 billion annually.³⁹

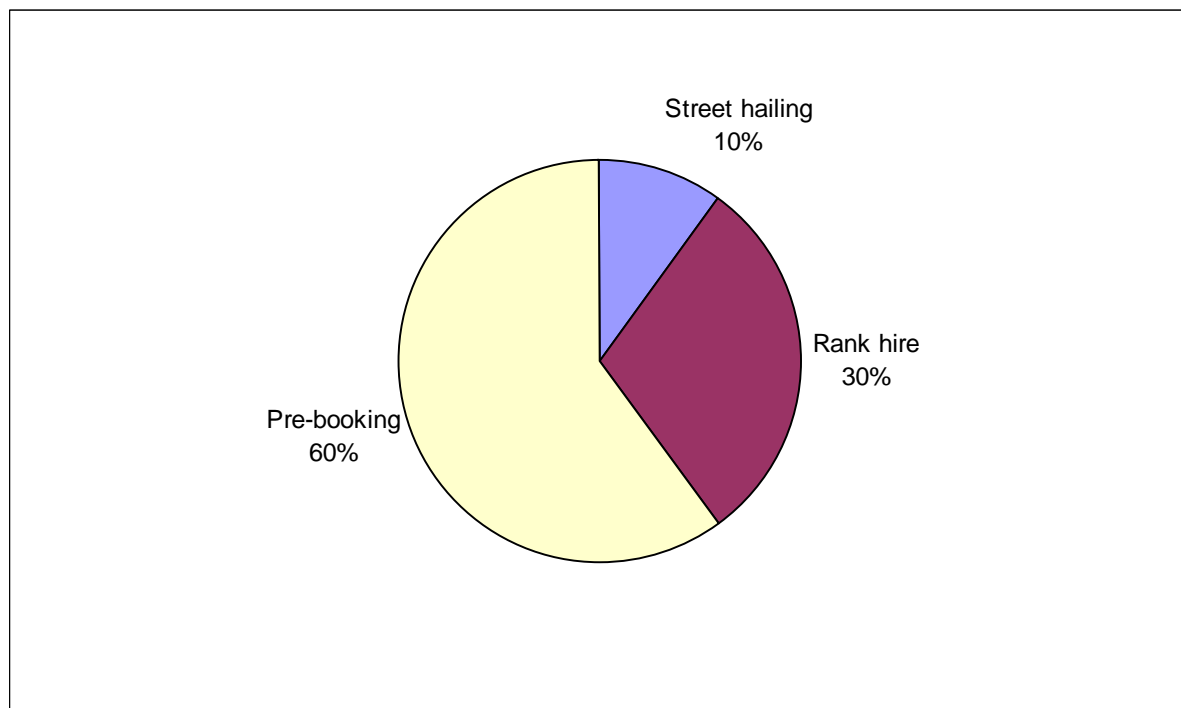
Number of vehicles and drivers

E.3 The breakdown of taxi usage between the principal hiring methods is displayed in Chart A5.1 below.

³⁸ This figure excludes spending on taxi services by business and tourist and therefore underestimates the total turnover.

³⁹ Plimsoll (2007) 'Plimsoll portfolio analysis: taxis and private hire' UK: Plimsoll Publishing Limited. This number includes the business of individual PHV drivers, but not taxi drivers. Therefore this figure also underestimates the total turnover.

Chart A5.1: Share of taxi services by hiring method



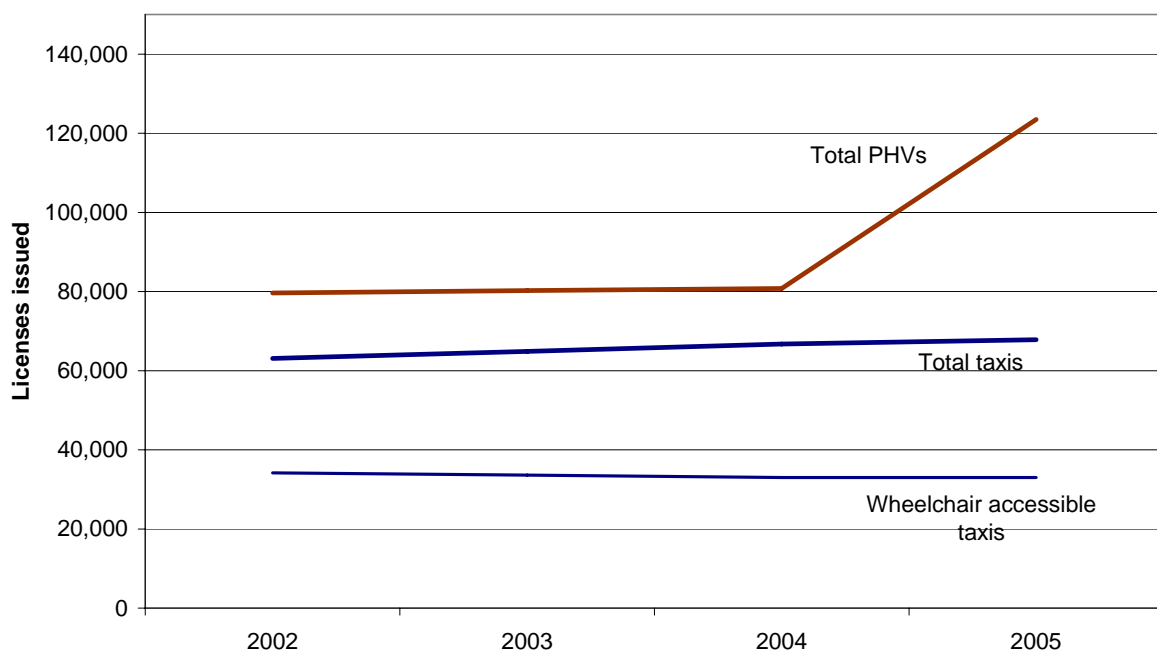
Source: Annexe D, Office of Fair Trading (2003) 'The regulation of licensed taxi and PHV services in the UK', Europe Economics calculation

- E.4 The pre-booked segment includes journeys for both taxis and PHVs, but the breakdown is not known.
- E.5 The prevalence of each hiring method depends heavily on the local demand characteristics. In general, street and rank hiring are more popular in urban areas, while in rural areas telephone booking normally dominates.
- E.6 The Department for Transport estimates that in 2005 there were 67,814 licensed taxis and 123,451 PHVs in England and Wales. Of the taxis, 33,011 – nearly half, were wheelchair accessible. In London (where there are no quantity restrictions) there were 20,750 taxis and approximately 40,000 PHVs. Every hackney carriage in London is wheelchair accessible.
- E.7 Not every taxi driver owns his or her taxi. Mainly due to the costs involved in owning and running a taxi, as well as quantity restrictions in many licensing authorities (and most of Scotland), it is not uncommon

for drivers to share vehicles. Some taxis are shared by up to three drivers. The owner can either rent the taxi to a part-time driver (a journeyman driver) who pays a regular fee or share it with another driver who uses it when the owner is not working, which might happen with father and son drivers.

E.8 Therefore, when looking at the number of taxis, it is important to differentiate between vehicles and drivers. See Chart A5.2 and A5.3 below.

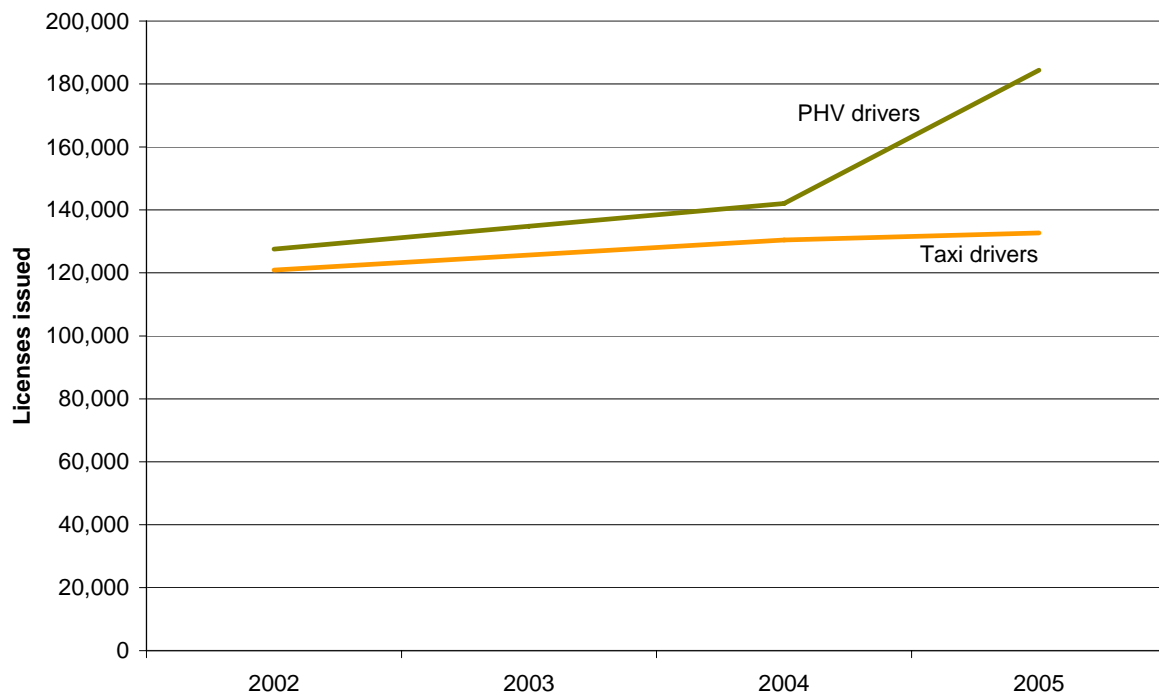
Chart A5.2: Number of licensed vehicle in England and Wales



*Note: Data for 2003 was unavailable, so the average of figures for 2002 and 2004 was used.
Source: Department for Transport*

E.9 Chart A5.2 above shows that between 2002 and 2005 in England and Wales, the number of taxi vehicles has increased marginally. This is unsurprising given the majority of LAs in England and Wales were already de-restricted in 2003. The significant increase in the number of licensed PHV vehicles between 2004 and 2005 is mostly due to the fact that Transport for London (TfL) started to license PHV vehicles in London at that time.

Chart A5.3: Number of licensed drivers in England and Wales



Source: Department for Transport

- E.10 Chart A5.3 above shows the number of licensed taxi and PHV drivers has exhibited a similar pattern of that observed in the number of licensed taxi and PHV vehicles. Again the significant increase in the number of licensed PHV drivers between 2004 and 2005 is mostly due to the fact that Transport for London (TfL) started to license PHV drivers in London at that time.
- E.11 According to stakeholders, turnover of drivers in the taxi and PHV industry is 'massive': turnover of PHV drivers is approximately 40 per cent per year, and due to the existence of higher barriers to entry in the taxi market (quantity restrictions, the Knowledge, etc.), turnover for taxi drivers is lower and between 8 and 10 per cent per year.
- E.12 Stakeholders have also suggested that the majority of new taxi drivers were previously PHV drivers, since working as a PHV driver proves to provide good training for working as taxi drivers.
- E.13 The number of wheelchair accessible taxis has remained roughly constant between 2002 and 2005. As to the design of taxi vehicles,

between 40 and 50 per cent of all taxi vehicles in the UK are manufactured by London Taxis International (LTI) and are specially-designed using the historical English-style chassis. Most other UK taxi vehicles have a body structure based on a European-style chassis, and vary in size and colour. Currently, only LTI vehicles are permitted in London due to their ability to complete a turning circle in 25 feet, as is required by the Public Carriage Office.⁴⁰ We have been informed by stakeholders that some other metropolitan areas have adopted the same policy as in London.

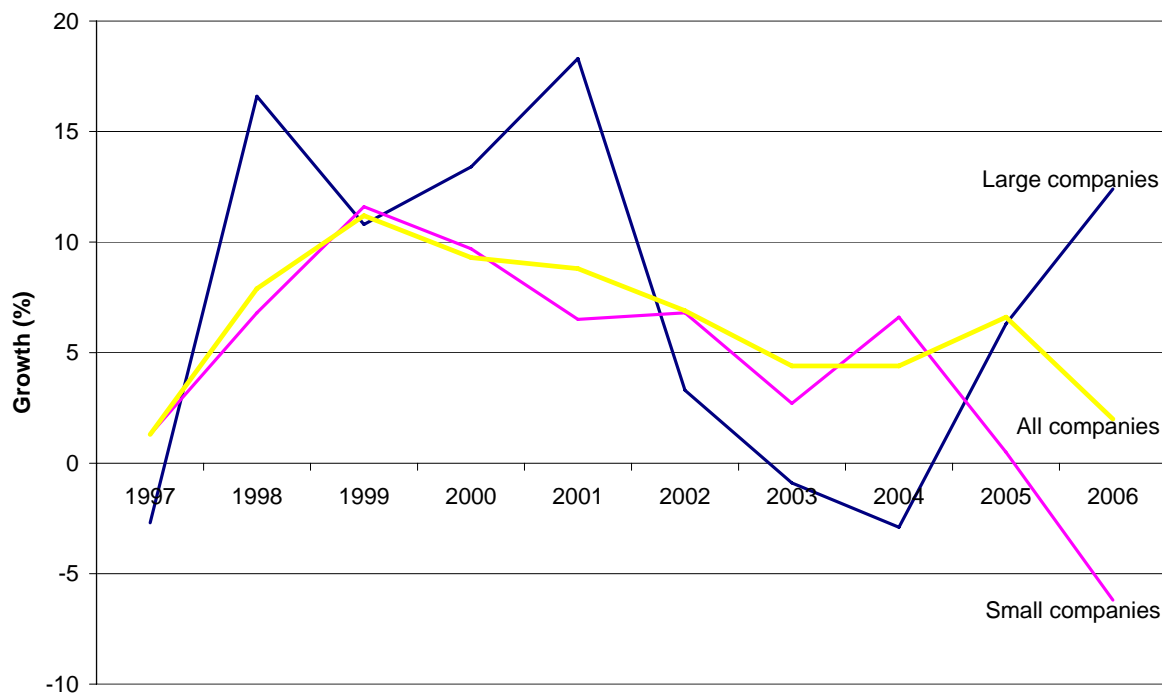
Taxi vehicle licence premium

Income and profitability

- E.14 Taxi drivers are mostly self-employed, and it is difficult to collect income data on individual taxi drivers. However, our stakeholder interviews do shed light on certain issues. Taxi vehicles can be rented or bought, and typically a new hackney vehicle (outside London) costs around £22,000 to buy or about £250 per week to rent. While new vehicles are likely to pay for themselves with longer lives, renting causes drivers to effectively pay for a new vehicle less than every two years. Insurance costs have been quoted to us at from £1,200 to £1,500 per year; however, for those with bad records or credit constraints, it can be much higher.
- E.15 Firms operating in the taxi and PHV business normally fall within one of the three following combinations: PHV only, taxi radio circuits, and mixed fleet. The two charts below illustrate median growth levels and profit levels for the industry on a whole. The data source does not distinguish taxi and PHV operators from the rest of the sector (i.e. vehicle manufacturers, radio and meter providers, chauffeur services, etc.), however, the majority of firms in the sample are taxi and PHV operators.

⁴⁰ Public Carriage Office (2007) 'Construction and licensing of motor taxis for use in London: conditions of fitness'

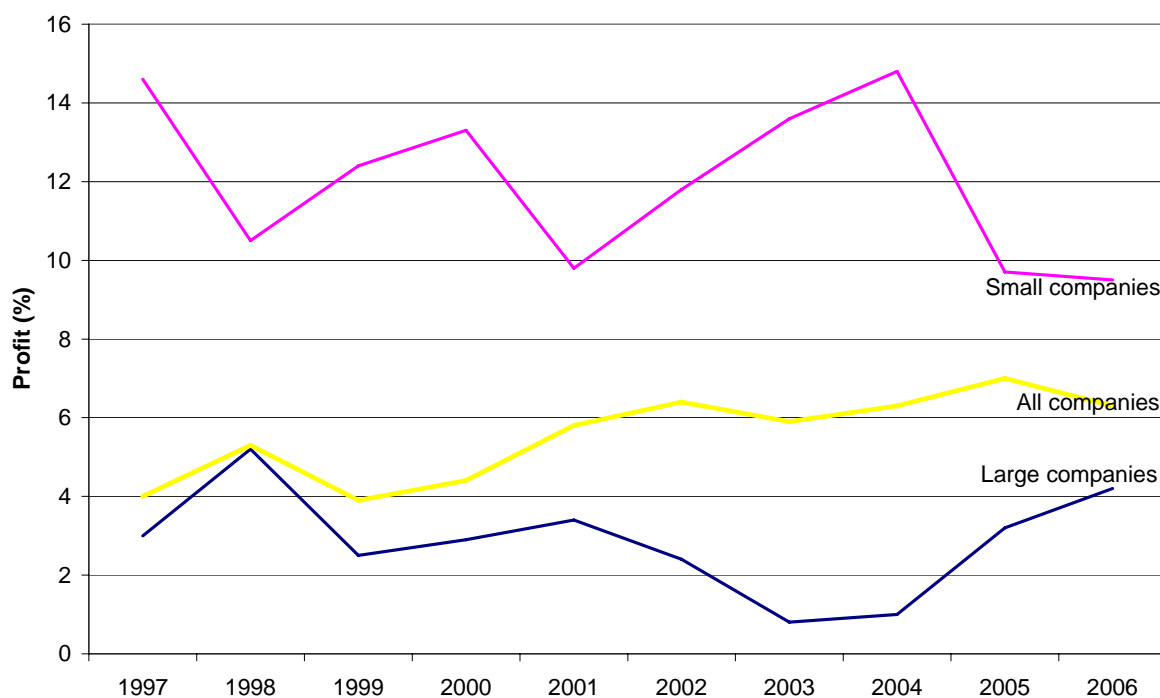
Chart A5.4: Median sales growth of firms



Source: Plimsoll (2007) 'Plimsoll portfolio analysis: taxis and private hire'

E.16 Chart A5.4 shows that the median sales growth levels of all firms fluctuate between 1997 and 2006, and large companies exhibit greater fluctuation than small ones.

Chart A5.5: Median pre-tax profit margin of firms



Source: Plimsoll (2007) 'Plimsoll portfolio analysis: taxis and private hire'

E.17 Chart A5.5 shows that the median pre-tax profit margin⁴¹ of all firms improved between 1997 and 2006, and smaller companies shows much higher median profit margin than large ones.

Regulatory development since 2003

Quantity restriction

E.18 More than half of LAs in England and Wales were already de-restricted (or never restricted) in 2003. Since the 2003 study, according to Department for Transport, of the 151 LAs in England and Wales which were restricted in 2003:

- 48 have de-restricted

⁴¹ Pre-tax profit margin is defined by the source as profit after depreciation, interest payments and adding back any non trading income, yet before tax is deducted. See Plimsoll Portfolio Analysis (2007) 'UK taxi and PHV industry' Stockton: Plimsoll Publishing Limited.

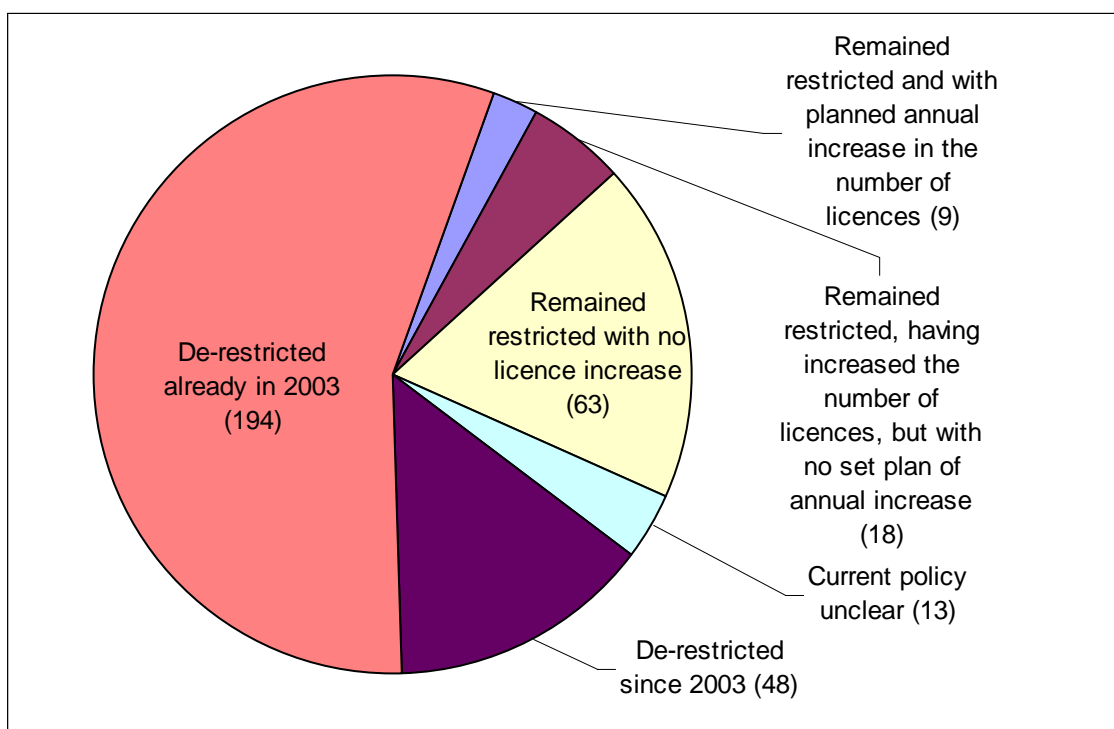
- nine remained restricted but have introduced a policy of issuing a certain number of licences annually
- 18 have remained restricted and increased the number of taxi vehicle licences, without adopting a formal policy of issuing a certain number of licences annually
- 63 have remained restricted with no increase in the number of taxi vehicle licences, and
- 13 do not state clearly their policy on entry control.

E.19 At the time of publication of the OFT study, Wales was already substantially de-restricted but Cardiff did not de-restrict until 2005.

E.20 Although a number of LAs in Scotland have removed quantity restrictions since 2003, including Aberdeen and Dundee, the majority of areas in Scotland sustain quantity regulation.

E.21 Chart A5.6 below shows the current composition of LAs with respect to quantity restriction.

Chart A5.6: Quantity restriction in England and Wales



Numbers in brackets show the number of LAs in each category
 Source: Department for Transport

Fare regulation

- E.22 Taxi tariffs are regulated in most LAs in the UK. Since 1976, fares have been set by each individual local authority, and the tariffs specified by LAs are mostly the maximum allowed.⁴²
- E.23 The practice of tariff setting differs greatly between LAs but a number stakeholders have told us that many LAs follow an indexed formula similar to that used by the Public Carriage Office in setting the taxi tariffs in London:

$$\text{Total tariff} = \text{average national earnings} + \text{operating costs} \quad (4.1)$$

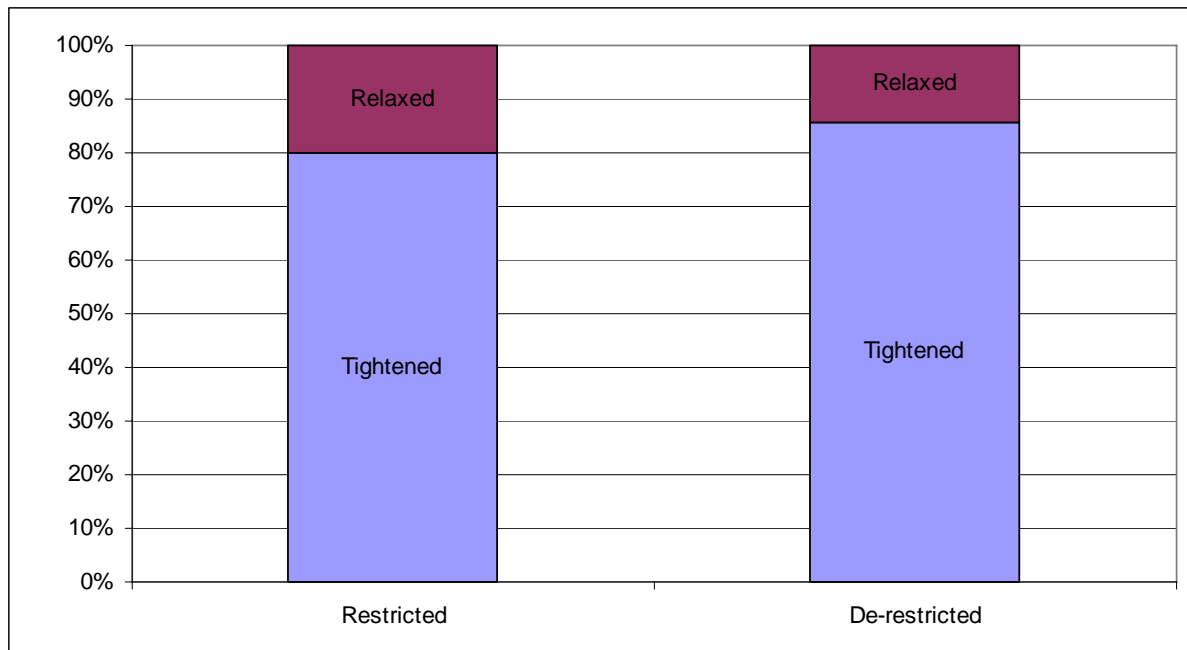
⁴² According to one stakeholder interviewed, certain companies discount the metered fare and charge less than standard fares.

- E.24 Average national earnings are used as a proxy for labour cost in driving taxis. Operating costs cover many items including vehicle cost, parts, fuel, insurance, garage and servicing, etc. Currently average national earnings and operating costs respectively account for roughly 60 and 40 per cent in taxi tariffs in London.
- E.25 LAs have considerable discretions in setting tariffs, and it has been suggested by stakeholders that in some LAs taxi trade unions have had significant influence on tariff setting.
- E.26 One particular issue raised by stakeholders is the difference between different tariffs. Normally tariffs for evening and weekends (Tariff 2) are higher than those for day time on weekdays (Tariff 1). However, some stakeholders have suggested that the difference between tariffs may be too small to give taxi drivers enough incentive to work in unsocial hours (for example late nights and weekends). De-restriction would allow journeymen drivers who were previously forced to work during night more freedom in choosing their working hours, and this may reduce the supply of taxi services in late night when the negative impacts of illegal taxis might be the highest.
- E.27 We are not aware of any significant changes in the practice of setting taxi tariffs (apart from the increase of the maximum tariff set, which is presented later in this section) since the 2003 study.

Quality regulation

- E.28 As shown in Chart A5.7 below, there has been a general trend towards tightening vehicle requirements among the LAs which, according to our LA survey, have changed their requirements on the age, the quality, or the type of vehicles that could be licensed as taxis.

Chart A5.7: Change in vehicle quality requirements in England and Wales since 2003



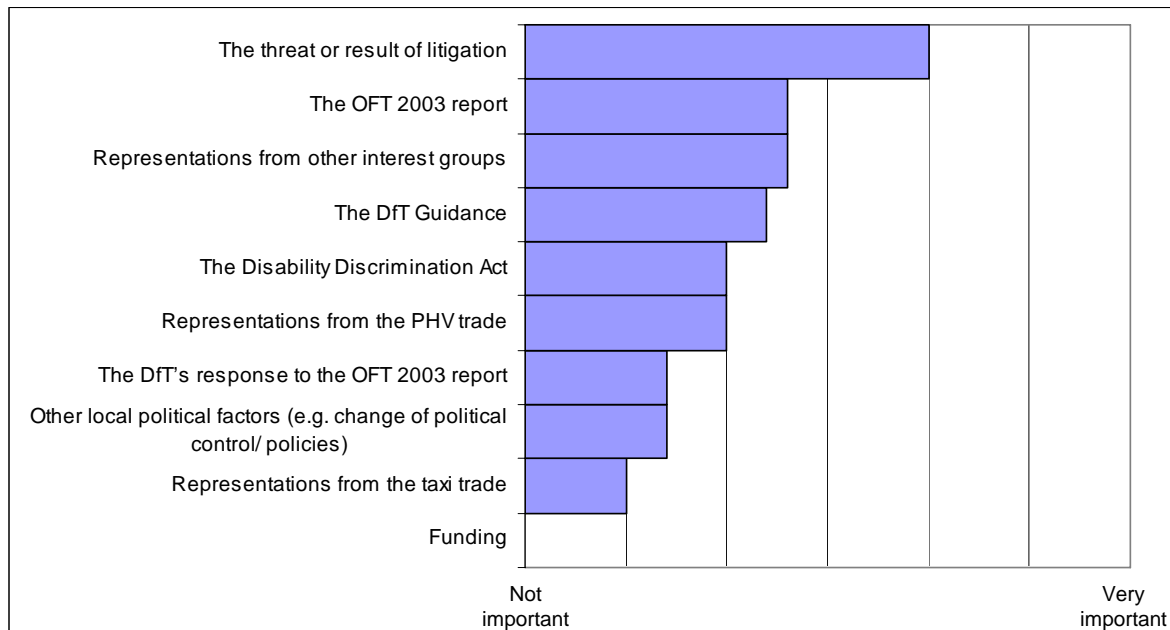
Source: LA survey

- E.29 In particular, none of the LAs which have de-restricted since 2003 in our survey has relaxed its vehicle requirements.
- E.30 According to stakeholders, the vehicle quality policies adopted by LAs in recent years are largely influenced by the Disability Discrimination Act. However, it has been suggested that there is not a sufficiently cohesive national disability requirements policy, which may have and will continue to cause confusions among LAs.

Influence of various regulatory factors

- E.31 Many factors have contributed to the regulatory decisions of LAs. Chart A5.8 below shows the importance of various factors reported by LAs which have de-restricted since 2003.

Chart A5.8: Influence of various factors on quantity regulation in LAs de-restricted since 2003



Source: LA survey

E.32 It seems that the 2003 study and follow up actions by others stimulated by the study have played an important role in the de-restriction decisions of these LAs.

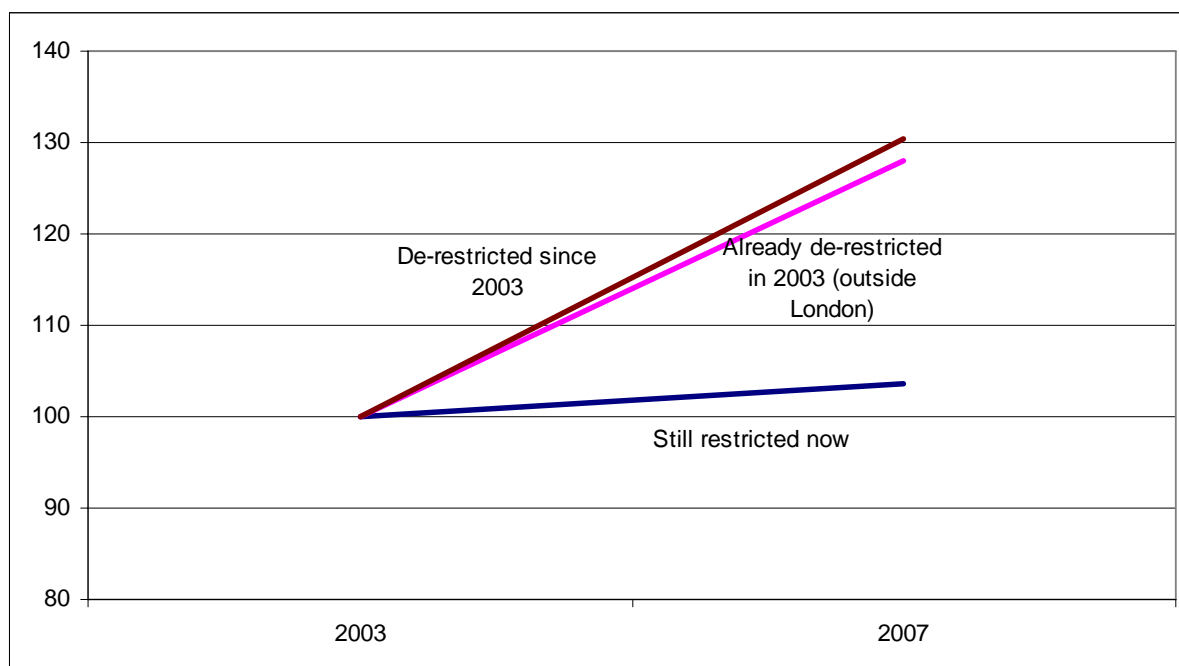
Changes in the market outcomes

Number of taxis and PHVs

E.33 Chart A5.9 and A5.10 below compares the percentage change of the number of taxis and PHVs in three groups of LAs:

- LAs already de-restricted in 2003 (outside London)
- LAs still restricted now, and
- LAs de-restricted since 2003.

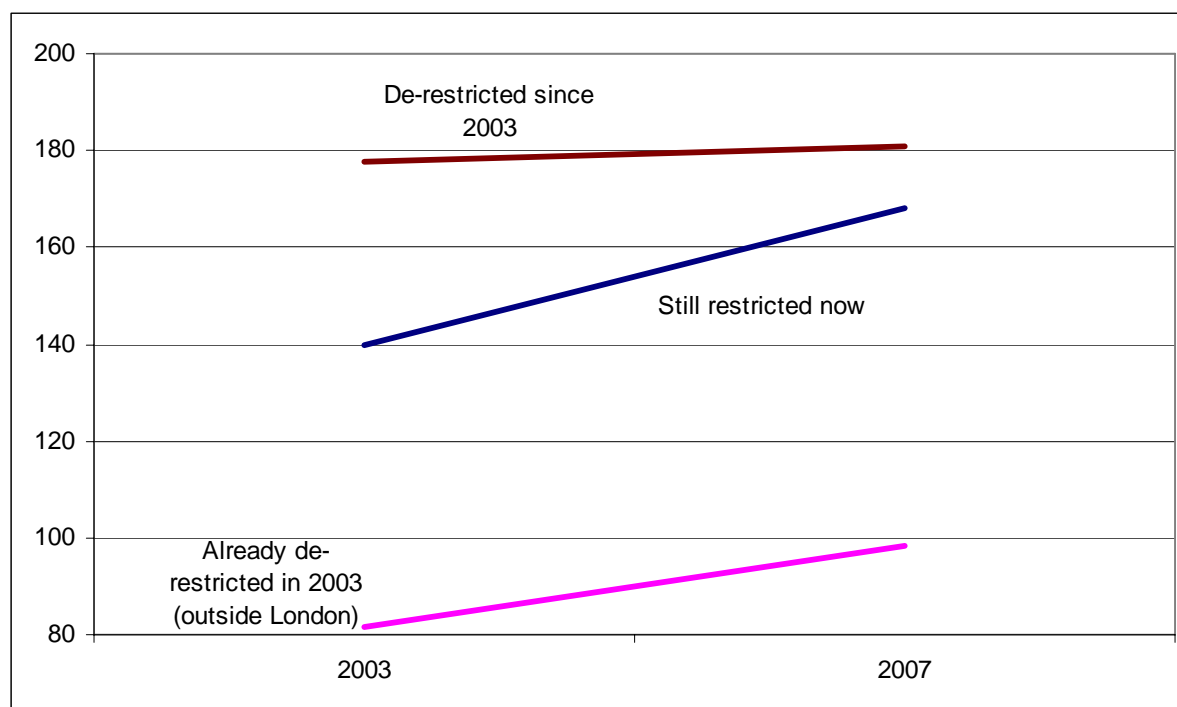
Chart A5.9: Change of number of taxis by quantity regulation



Number of taxis in 2003 = 100
Source: LA survey

- E.34 Unsurprisingly it could be seen that the LAs de-restricted since 2003 exhibits much higher growth rate of the number of taxis than the LAs still restricted. It is also interesting to note that the LAs already de-restricted in 2003 exhibits only slightly lower growth rate in the number of taxis than the ones newly de-restricted.
- E.35 The number of taxis in still restricted LAs increased by less than 4 per cent since 2003. While the 2003 study may have had some impact in regulated areas by stimulating some LAs to grant additional licences, these figures suggest that the main impact was in the areas which de-regulated.

Chart A5.10: Change of number of PHVs by quantity regulation



Number of taxis in 2003 = 100
 Source: Department for Transport

E.36 In order to compare changes in taxi and PHV numbers, the number of PHVs in each group of LAs has been normalised by the number of taxis. This is shown in Chart A5.10. Thus, for example, areas that remained restricted had 40 per cent more PHVs than taxis in 2003. Unsurprisingly the number of PHVs in still restricted areas has increased the most, given that the number of taxis in these areas cannot respond to changes in overall demand for taxi services as much as the numbers of taxis in de-restricted areas. Interestingly the magnitude of such increase of the number of PHVs in restricted LAs is quite similar to the increase of the number of *taxis* in the LAs newly de-restricted, where the number of PHVs barely changed. Moreover, the newly de-restricted LAs had the highest PHV to taxi ratio in 2003 and remained so in 2007, although the gap has been narrowed.

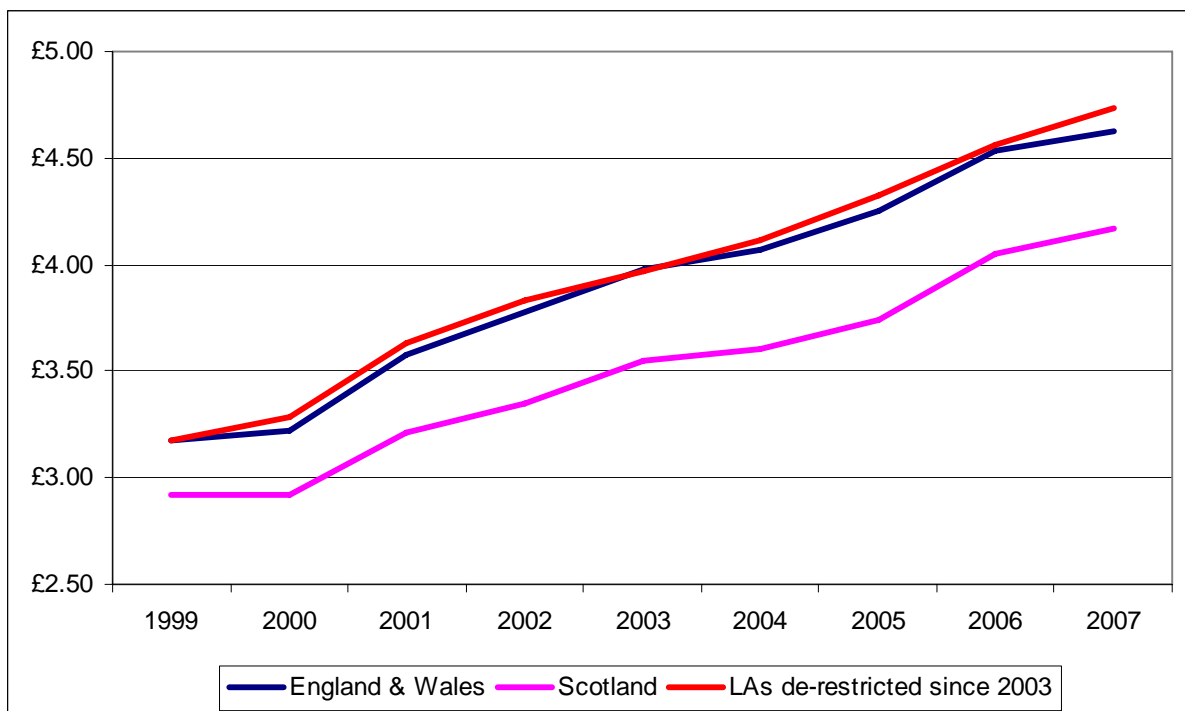
E.37 It is possible to draw some tentative conclusions from these charts. The growth in the number of taxis from 2003 to 2007 was greater in de-restricted areas than in those that remained restricted. By contrast the growth in the number of PHVs was slower in de-restricted than in

restricted areas. Assuming that these patterns are typical for the different types of area, it seems that there is a 'replacement effect' between taxis and PHVs in the newly de-restricted LAs. Moreover, given the higher growth rate of PHVs in the LAs already de-restricted in 2003, it is possible that the newly de-restricted LAs as a whole may still be in the process of market adjustment and any 'replacement effect' may be temporary. This may suggest that, after de-restriction, existing PHV drivers are those most ready to take the opportunity to operate licensed taxis and this leads to temporary slower growth in the PHV sector which is, at least in part, offset in later years.

Taxi fares

E.38 Chart A5.11 below shows the movements in the average regulated two-mile fares since 1999.

Chart A5.11: Average regulated maximum two-mile fares (1999 – 2007)

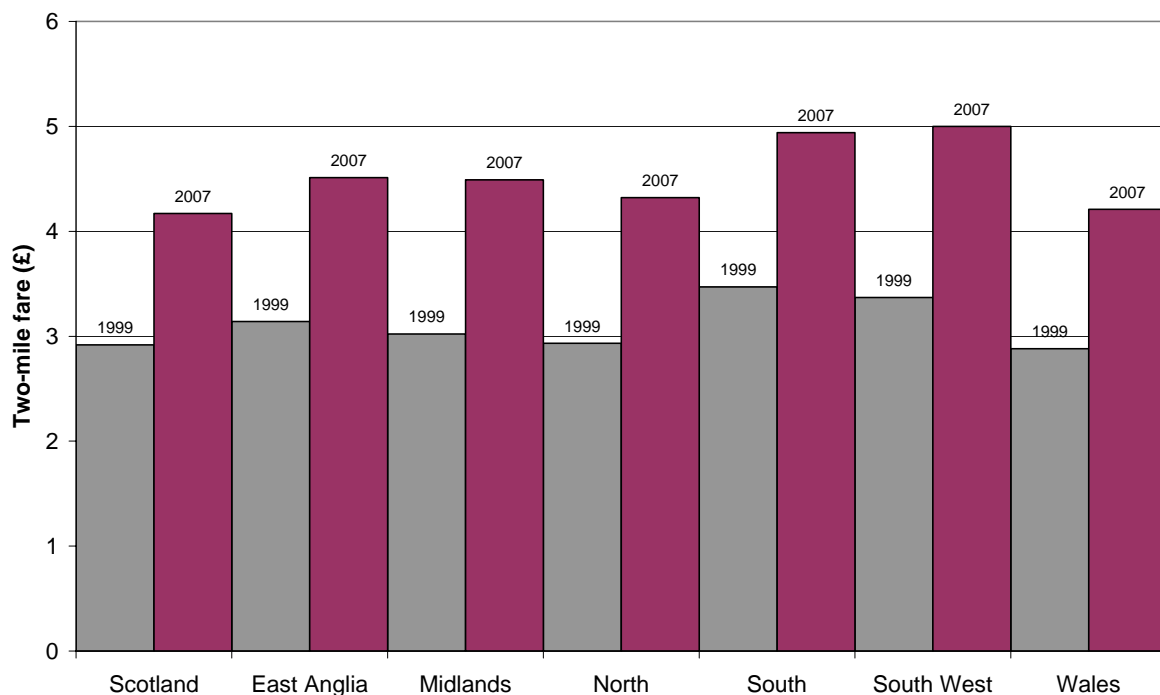


Source: National Private Hire Association, 2007

E.39 It can be seen that the average regulated maximum two-mile fares in both England and Wales and Scotland have increased by about 50 per

cent since 1999, and the fare changes in both regions exhibit very similar patterns. Moreover, there is no appreciable difference in the change of regulated fares between the LAs de-restricted since 2003 and the rest of England and Wales. Chart A5.12 below shows the regional difference in fare changes.

Chart A5.12: Average regulated maximum two-mile fares (1999 – 2007)



Source: National Private Hire Association, 2007

E.40 Fares are highest in the South and Southwest and lowest in Scotland and Wales. However, the differences in fare between regions are not significant and are lower than the average fare increase between 1999 and 2007.

Waiting time

E.41 We have analysed data on passenger and driver waiting time at taxi ranks in a number of LAs, including both restricted and de-restricted ones, drawing on the surveys carried out by Halcrow. Tables A5.1 and A5.2 below present the results on the reduction in passenger and driver waiting time respectively. The average figures contained in the tables are

derived by normalising the data in each individual LAs to a four year period between 2003 and 2007 and further weighting the data using the population in each LA. Detailed explanations are provided in Annexe 6.

Table A5.2: Change in passenger waiting time

	Waiting time (minutes)		Change in waiting time	
	Initial observation	Recent observation	Absolute change (minutes)	Percentage change (%)
De-restricted LAs:				
Cambridge	2.29	1.67	-0.62	-27
Cardiff	0.80	0.34	-0.46	-58
Sheffield	1.46	0.23	-1.23	-84
Wolverhampton	1.49	0.22	-1.27	-85
Average	1.37 ^a	0.39 ^a	-0.63 ^b	-57 ^b
Restricted LAs:				
Blackpool	0.44	0.42	-0.02	-5
Bournemouth	0.66	0.37	-0.29	-44
Brighton	1.11	0.73	-0.38	-34
Hull	1.53	0.68	-0.85	-56
Leicester	1.17	0.35	-0.82	-70
Thurrock	0.50	0.20	-0.30	-60
Wigan	1.17	0.60	-0.57	-49
Average	1.03 ^a	0.51 ^a	-0.50 ^b	-47 ^b
Difference ^c	0.34	-0.12	-0.13	-10

a: weighted by the population in each LA;

b: normalised by the number of years between observations and weighted by the population in each LA;

c: the average figures in de-restricted LAs minus the average figures in restricted LAs.

Source: Halcrow and Europe Economics calculation

E.42 Table A5.1 shows that the average passenger waiting time at taxi ranks in both restricted and de-restricted LAs has decreased significantly since 2003 and, unsurprisingly, de-restricted LAs experienced a larger reduction in passenger waiting time.

E.43 It is interesting to compare how driver waiting time has changed during the same period.

Table A5.3: Change in driver waiting time

	Waiting time (minutes)		Change in waiting time	
	Initial observation	Recent observation	Absolute change (minutes)	Percentage change (%)
De-restricted LAs:				
Cardiff	8.53	18.84	10.31	121
Sheffield	12.93	13.99	1.06	8
Wolverhampton	11.23	19.66	8.43	75
Average	10.28 ^a	16.66 ^a	7.79 ^b	100 ^b
Restricted LAs:				
Blackpool	10.23	10.35	0.12	1
Bournemouth	9.83	12.25	2.42	25
Brighton	8.31	7.64	-0.67	-8
Hull	9.34	12.52	3.18	34
Leicester	20.19	19.36	-0.83	-4
Thurrock	12.50	15.28	2.78	22
Wigan	11.98	21.07	9.09	76
Average	12.12 ^a	14.70 ^a	2.58 ^b	23 ^b
Difference ^c	-1.84	1.94	5.22	77

Note: we have no data for Cambridge

a: weighted by the population in each LA;

b: normalised by the number of years between observations and weighted by the population in each LA;

c: the average figures in de-restricted LAs minus the average figures in restricted LAs.

Source: Halcrow and Europe Economics calculation

E.44 Table A5.2 shows that the average driver waiting time at taxi ranks in both restricted and de-restricted LAs have increased significantly since 2003, and that the increase in driver waiting time was greater in de-restricted areas. Moreover, the difference in the increase of driver waiting time is bigger than that of the reduction of passenger waiting time. There is considerable dispersion in the changes in driver waiting time and the average differences should be used with caution. Moreover, the two samples are not fully comparable because we do not have driver waiting time data in Cambridge. Furthermore, the licensing officers of

Cardiff and Wigan have suggested there have been developments in these two areas which might potentially have distorted the results.⁴³

E.45 Table A5.3 below present the number of taxi vehicle licences in each LA in our sample. It could be seen that there has been a roughly 70 per cent increase in the number of taxis in the de-restricted LAs, while the number of taxis in still restricted LAs increased by around 4 per cent only, which is similar to the overall increase in the number of taxis in all the still restricted LAs in England and Wales.

Table A5.3: LAs used in our quantification

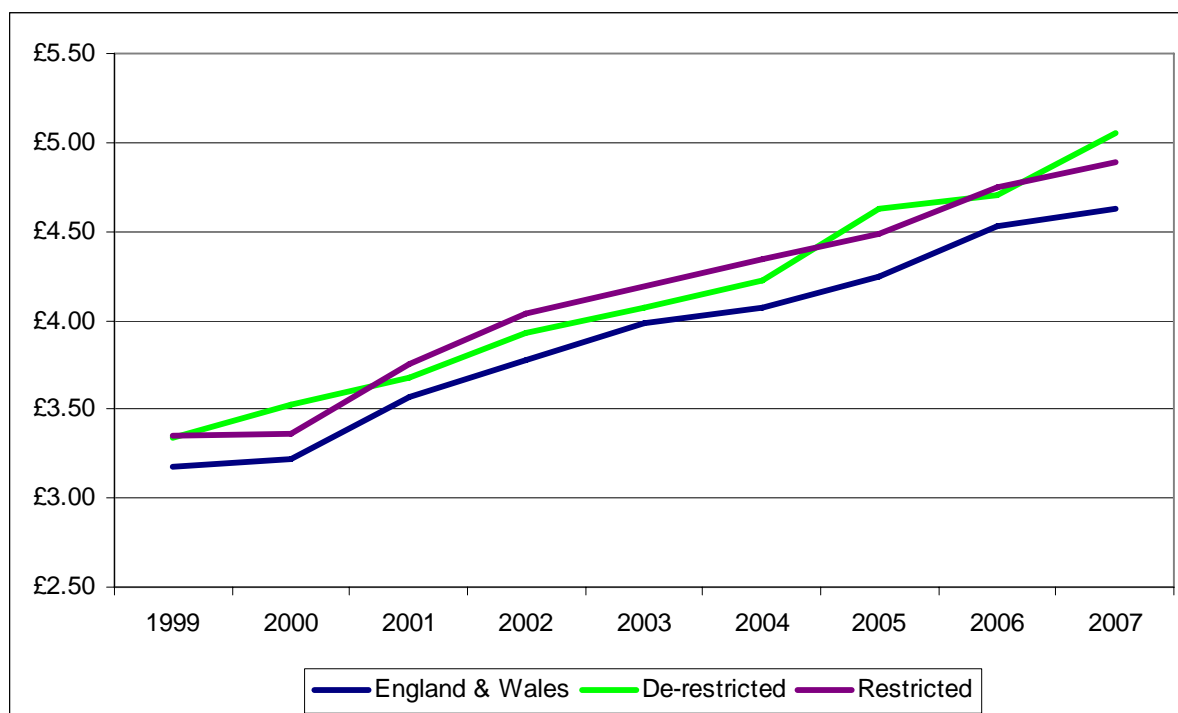
Licensing Authority	First Observation		Last observation	
	Year of earliest data	Number of vehicle licences	Year of latest data	Number of vehicle licences
De-restricted LAs:				
Cambridge	1999	147	2003	205
Cardiff	2001	480	2007	704
Sheffield	1998	300	2007	739
Wolverhampton	2003	92	2007	110
De-restricted total:		1,019		1,758
Still restricted LAs:				
Blackpool	1998	256	2006	256
Bournemouth	2002	229	2005	249
Brighton	2002	459	2006	493
Hull	2000	150	2006	170
Leicester	2001	307	2005	318
Thurrock	2003	90	2006	90
Wigan	2002	136	2006	136
Restricted total:		1,667		1,762

Source: Halcrow and OFT (2003) 'The regulation of licensed taxi and PHV services in the UK'

⁴³ In Cardiff, it has been suggested that Cardiff city centre is undergoing a shopping centre redevelopment that has effected the road system and ranking facilities in the city centre which may have reduced the number of persons seeking the facilities provided by taxicabs. In Wigan, it has been suggested that a late night bus service, operating between 2300 hours and 0320 hours, was introduced on several of the busiest routes and considered by the taxi trade as having significantly affected their trade in the late evening / early morning hours.

E.46 Chart A4.13 below presents the changes in the regulated fares in the de-restricted and restricted LAs in our sample. It shows that there is significant difference in the changes of regulated fares between de-restricted and restricted LAs in our sample.

Chart A5.13: Average regulated maximum two-mile fares of LAs in our sample (1999 – 2007)



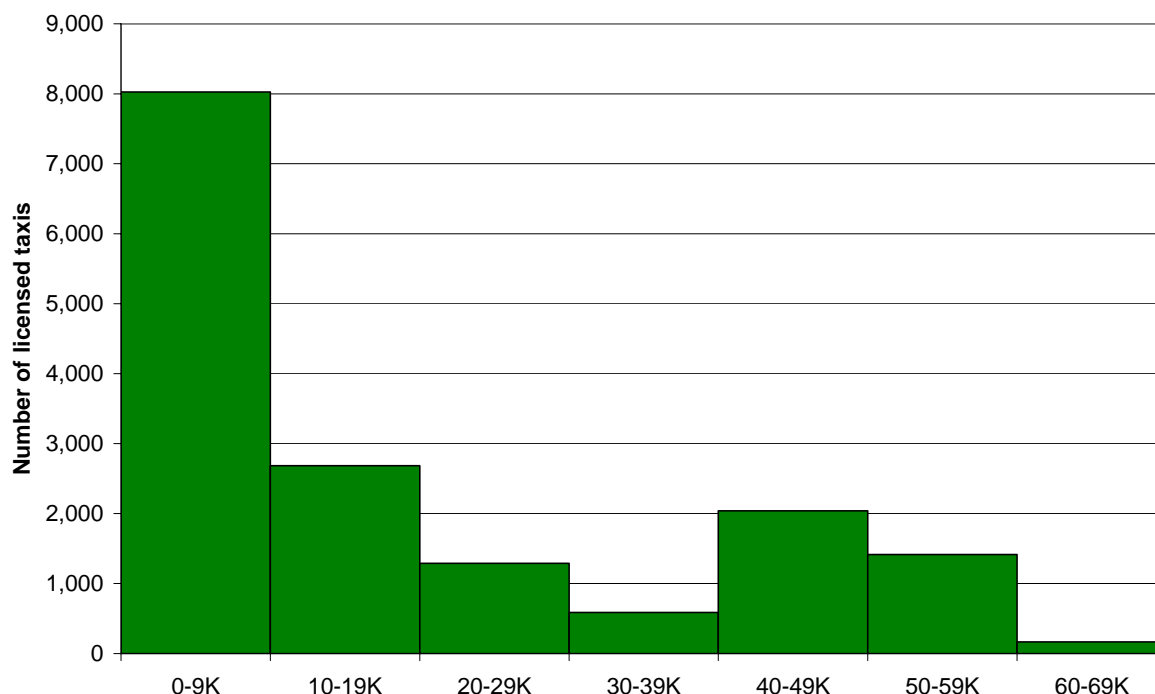
Source: National Private Hire Association, 2007

Licence premium

- E.47 Prior to de-restriction, it was commonplace for taxi licence plates to switch hands for amounts above the actual licensing fee. Quantity de-restriction renders the premium obsolete, because new entrants no longer need to buy a taxi vehicle licence from an incumbent to enter the market.
- E.48 Annexe E of the 2003 study suggested that licence premium values ranged between zero and slightly less than £70,000 in 2003. This is consistent with the findings of our LA survey, the results of which are

presented in Chart A5.14 below. This includes premiums reported by both restricted and de-restricted LAs.⁴⁴

Chart A5.14: Number of taxis by licence premium band



Source: LA survey

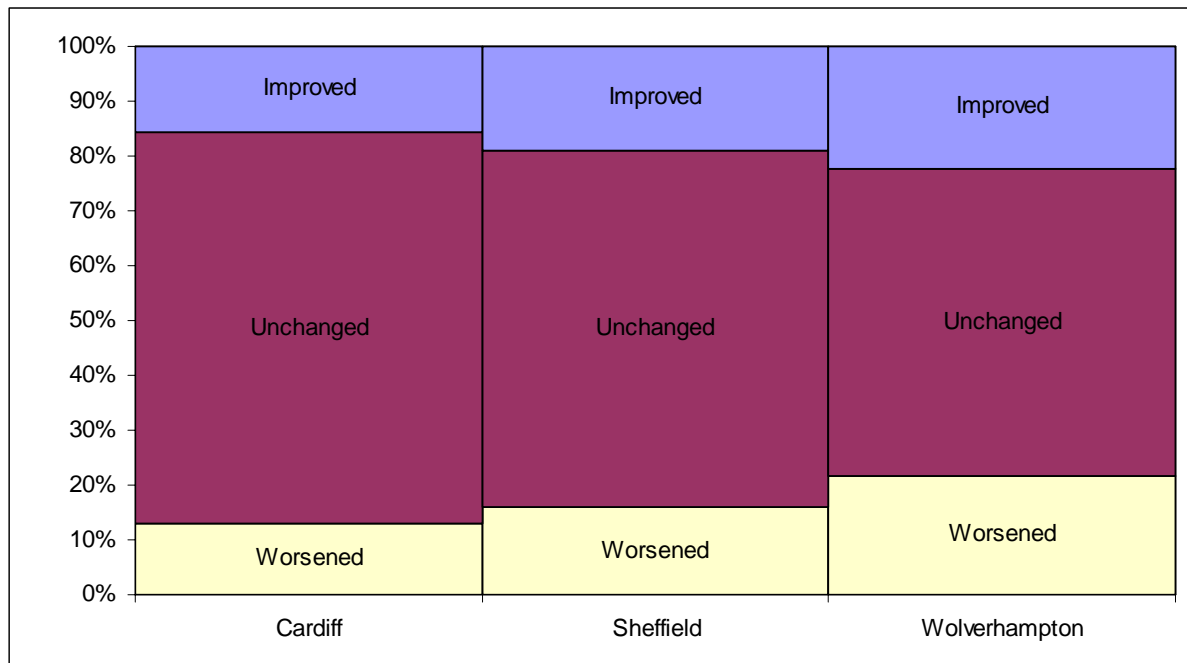
E.49 Our LA survey shows that the average licence premium, weighted by the number of vehicles in each LA, was £29,753 in 2007. This is very similar to the value reported by Taxi Driver Online, which suggests a weighted average licence premium of £33,635 in 2007.

Quality of service

E.50 We have collected data on consumers' perceptions of the changes in taxi and PHV service quality in three de-restricted LAs.

⁴⁴ In some de-restricted LAs, new taxi vehicle licences will only be issued to wheelchair accessible vehicles. Therefore a premium, on top of the value of the vehicle, is attached to the existing licensed non-wheelchair accessible taxi vehicles.

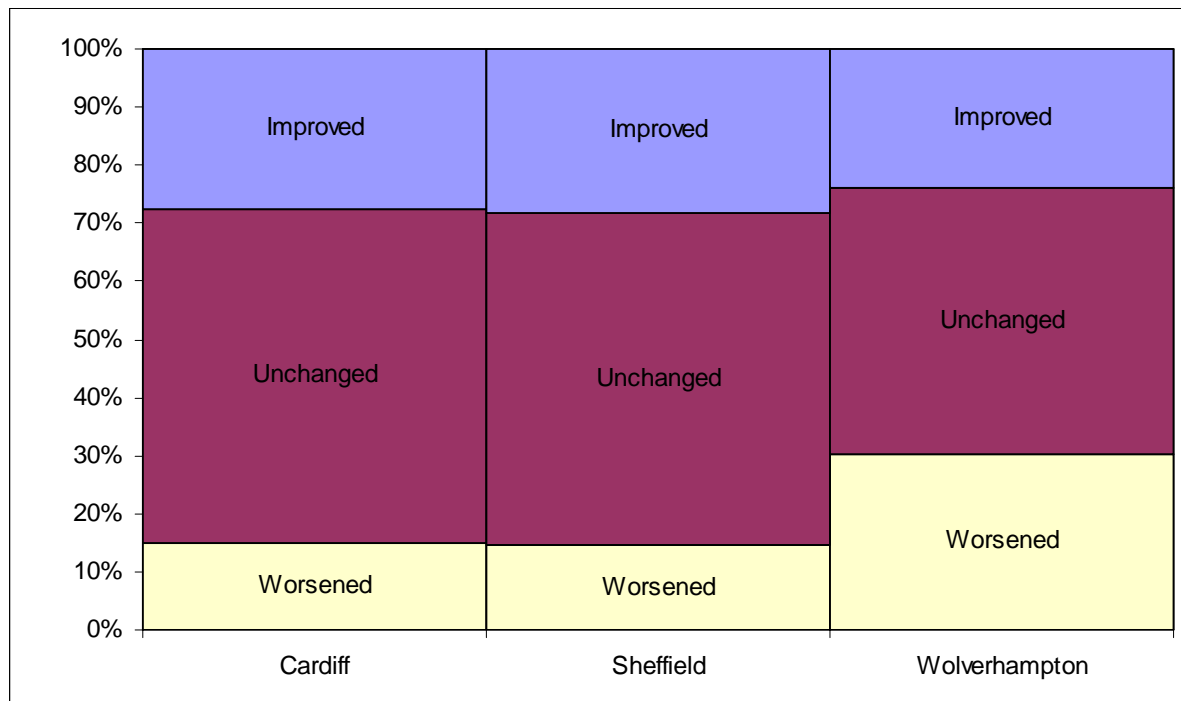
Chart A5.15: Consumers' perception on the quality of service since de-restriction



Source: Case study

E.51 Contrary to what many had expected, the quality of taxi services in all three de-restricted areas has largely remained unchanged.

Chart A5.16: Consumers' perception on the availability of taxis since de-restriction



Source: Case study

E.52 The picture on the change in the availability of taxis is mixed. In Cardiff and Sheffield the numbers of consumers reporting improved taxi availability are higher than those reporting worsened taxi availability. However, it is the opposite in Wolverhampton.

E.53 This is consistent with the perceptions of stakeholders, which suggest that there has not been a significant change in the service quality in de-restricted LAs.

Illegal taxi and crime

E.54 Taxis may operate illegally in a number of different ways. This may involve a licensed taxi operating outside of the terms of its licence. For example licensed taxis or PHVs which pick up services out of their licensed area or PHVs which pick up services on street or at ranks. In such circumstances customers may be at risk because the taxi's insurance cover may not be valid. Of greater concern is the operation of taxis by drivers and vehicles which have no licence and have therefore

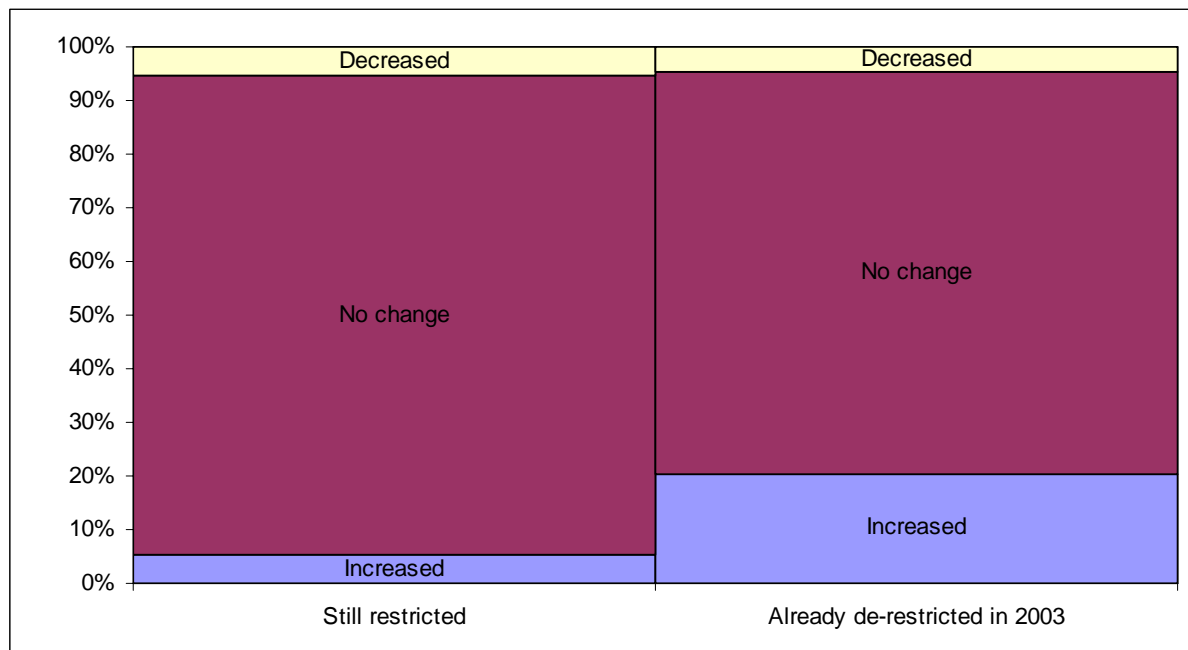
not been subject to any of the eligibility and quality checks required to obtain a licence. It is this category of illegal operation which was of most concern in the 2003 study.

- E.55 We have not been able to obtain any data on either the usage of illegal taxis or illegal taxi related crime. However, de-restriction increases the availability of legal taxis and makes it easier for people to operate taxis, therefore it should reduce the demand for and supply of illegal taxis.
- E.56 Enforcement is an important issue, and stakeholders suggest that many LAs do not devote the necessary resources to ensure effective monitoring and enforcement, especially during late night or peak hours. However, the main concern, apart from the operation of completely unlicensed vehicles, raised by stakeholders representing taxi drivers was with PHVs illegally plying for hire on the street, particularly late at night.

Complaints

- E.57 Some LAs handle complaints on taxis submitted by passengers. Chart A5.17 below shows the changes in the number of complaints received by LAs.

Chart A5.17: Change in the number of complaints on taxis



Source: Case study

E.58 We do not have relevant data on any LAs which have de-restricted since 2003, so it's difficult to analyse the impact of de-restriction on complaints. A bigger percentage of LAs among the de-restricted ones reported increased number of complaints, which may partly reflect the fact that the total number of taxi journeys would increase after de-restriction.

Taxi drivers

E.59 The view among stakeholders interviewed that drivers have had to work longer hours for lower income since taxi de-restriction was nearly unanimous. Estimates vary, but stakeholders suggest that on average a driver previously working 35-45 hour weeks now must work 50-60 hour weeks to earn the same income. The suggestion that drivers have to work longer hours is consistent with our findings on driver waiting time at taxi ranks.

Experience of other jurisdictions

E.60 In this study, we have also reviewed literature which describes the experiences of de-restriction in some other jurisdictions in addition to those summarised in Annexe J of the 2003 study. We present below our findings as a comparison to what has happened in the UK since 2003. However, the experience of other jurisdictions should be treated with caution when used as guide on what might happen or have happened in the UK, because there are significant differences in the market and regulatory characteristics between the UK and other jurisdictions.

Ireland

E.61 In the late 1990s, Fingleton, Evans, and Hogan (1998) argued for the urgent need of entry de-restriction in Dublin. At the time of the study, the taxi market was suffering 'chronic excess demand', with significant queues yet not one substantial increase in licensing since 1978. Perhaps from taking into account other experiences with taxi quantity de-restriction, the paper, rather than focusing on relaxing entry restrictions alone, emphasised the need for a whole set of regulatory methods, including de-regulation of entry to the taxi market, the retention of fare regulation, and a higher quality standards and better enforcement.

E.62 One of the important conclusions of the study involved a detailed description of the necessary approach to de-regulating entry. Because of the accrument of licence premium value, a caveat to total de-restriction was that it would result in a massive utility loss to existing licence holders. The authors sought to deal with this using a staggered approach, which would involve issuing extra free licences to existing licence holders and enabling licence transaction. The authors calculated that this would compensate licence holders on average in proportion to their perceived losses, and offer a placid way to avoid potential political unrest.⁴⁵

⁴⁵ Unfortunately, this was not the actual result of entry de-restriction in Ireland. See Kopp (2007) 'Summary of discussions' Round Table Report on Transport Economics: (De-)Regulation of the Taxi Industry, Paris: OECD Publishing.

- E.63 The actual de-restriction in Ireland was very dramatic and abrupt. As summarised in Barrett (2003) and Bakker (2005), in 2000 the High Court ruled against the Ministry of the Environment and Local Government's initial decision to issue extra licences to existing licensees. It at the same ruled to deregulate the entry of taxis.
- E.64 After de-regulation, the number of taxis soared from 2,720 in 2000 to 9,230 in 2002. Unsurprisingly waiting times were significantly reduced. However, the utilisation rate of taxi vehicles decreased, as journeymen drivers switched to become taxi owners. The demand for taxi services did not increase as much as the supply, which reduced the profitability in the industry and put pressure on quality and fares.
- E.65 Based on the effects of the de-restriction, the Competition Authority in 2002 suggested that the maximum fares should continue to be set by local governments, while fares should be rebalanced to reduce excess supply and assure adequate service at all times.
- E.66 One interesting issue is the compensation for previous licence holders. The deregulation effectively wiped out the second-hand value of the tradable licence plates. Certain licence holders suffered extreme personal financial hardship and, as a result, a Hardship Panel was established to consider the need for compensation, which did issue compensation to previous licence holders based on their individual economic loss. The Office of Taxi Regulator was also established following the de-restriction.

US and Canada

- E.67 Schaller (2006) uses data from 43 communities in the US and Canada to assess the effects of entry regulation on taxicab availability and service quality. The paper finds that very different results appeared in the two taxi market segments: the street and rank hiring segment and the pre-booking segment. Entry de-restriction in street and rank hiring market usually leads to excess supply, which in turn results in the deterioration of vehicle and driver quality. On the other hand, when entry is de-restricted in the telephone order market, there is often an undersupply of cabs.

Sweden

- E.68 The experience in Sweden is a good indication of the importance of considering the individual supply/demand characteristics of different taxi service segments when designing regulatory policies.
- E.69 The Swedish taxi sector was de-restricted in 1990. It was expected at that time that deregulation would promote a competitive market, thereby increasing supply, lowering prices, boosting efficiency, better integrating the taxi market into the broader economy, and promoting service innovation. However, Marell and Westin (2002) find that few of these results were achieved: there was no permanent increase in the number of vehicles in the market, real prices rose, and neither service nor vehicle efficiency increased. When entry into the market was de-restricted, an influx in the number of taxis entering the market did occur. However, by 1999 the number of cabs in the market had reverted back to the pre-regulatory levels. The one exception is with regard to service innovation, which was improved (waiting time was decreased as well, but the authors do not categorise this as a positive outcome).
- E.70 The main explanation for this provided by the article is the impact of characteristics which differ among geographic regions, namely between rural and urban regions. In rural areas, due to the low population density in rural areas, it is not easy to operate a satisfactory and competitive public transport system. Therefore, in rural areas over 80 per cent of taxi services are publicly subsidised at lower fares, and existing operators usually enjoy large market shares in these regions. School taxis and transport by taxi for the disabled or sick are all subsidised by the Swedish government – and all more common in rural areas.
- E.71 Therefore, barriers to entry, while being reduced in urban areas, are still quite prevalent in rural areas. Moreover, there is incentive to flock to urban areas where both aggregate demand and demand for private trips is higher. Essentially, it is very difficult for new entrants to survive in rural areas; but the threat of competition in urban areas displaces many existing drivers/operators. So quantity of players remains roughly constant.

- E.72 Since competitiveness did not improve in rural areas, there is not as much downward pressure on prices as what one might expect under quantity de-restriction. Nevertheless, prices in urban areas, while increasing overall, were still below those in rural areas. The explanation offered for the general decrease in efficiency of drivers and service is based on the premise that efficiency is facilitated by increased fleet size, which enables operators to cover broader areas of consumers with less cost in time and money. In rural areas, where service is largely based on subsidised trips, taxis are only in operation during a fixed window of time and this prevents firms from growing their businesses in a cost-effective manner. Unfortunately, the extremely different conditions in the two areas make very few firms able to structure themselves in ways that enable them to effectively serve either area at once.
- E.73 Nonetheless, innovations saw improvement in rural areas. For example, despite rescinding the requirement for taxis in rural areas to be associated with a dispatch unit, most drivers found this quite helpful in order to cast a wider net over possible rides. This allowed taxi companies to be large and diversified enough to better compete with each other.

The Netherlands

- E.74 The Netherlands taxi industry was substantially de-restricted in 2000: quantity control was removed, fixed fare regulation was replaced by a maximum fare regulation, and transport zones were abolished. Having watched the mixed effects of de-restriction in other countries, the Netherlands avoided a policy of complete deregulation and, instead, 're-regulated' the industry through recentralising of licensing and intensifying enforcement. Furthermore, de-restriction was phased in on a gradual basis, under a system of intense monitoring to safeguard basic service quality and fair competition.
- E.75 Bakker (2005) found that while the total number of taxi drivers and taxi vehicles has increased, there has been a decrease in the actual operating hours and annual revenue per taxi. The real fare had increased after de-restriction, and consumer satisfaction and efficiency remained more or less the same. However, the turbulence in the market increased, as

indicated by the increase entry and exit of taxi operators. The consumer satisfaction on availability of taxi services has increased even after the abolishment of 24 hours service requirement.

- E.76 It is thought that lower fares were not achieved for a few reasons. First, the de-restriction abolished various fixed prices set by regional authorities and set a nation-wide price ceiling, which acted in practice as a fixed price. Second, a large segment of the taxi market is not price-sensitive due to either high-incomes, reimbursement from employers or insurers, or lack of choice (such as being ill or disabled). Third, it is difficult for consumers to shop around on prices due to both the general first-come-first-serve behaviour at taxi ranks and the difficulty in predicting the total cost before the taxi journey as fare levels are generally advertised on various components (for example fare per kilometre).
- E.77 The study is careful to highlight the demand-side impacts of de-restriction and suggests that heterogeneity in consumer needs should have been better addressed in forming regulatory policy. The paper also speculates that based on other countries' experiences, further developments and improvements from de-restriction may still be in waiting.

Summary

- E.78 There are some conclusions from the above discussions on experience in other jurisdictions.
- E.79 First of all, as Kopp (2007) found, there is an important difference between the 'cruising market' (for example the street and rank hire segment by our definition) and the 'dispatch centre market' (for example the pre-booking segment by our definition) in terms of their need for regulations and their responses to de-restriction.
- E.80 Second, some expected effects of de-restriction do have taken place. For instance, in countries where entry has been deregulated, the number of taxis had generally increased significantly and the waiting times had substantially decreased.

- E.81 Third, there is a need for quality regulation, as mass entry has also generally led to a decrease in quality of service. This has in some cases led to re-restriction, and Kopp (2007) questions whether this could be a vehicle for regulatory capture.
- E.82 In Ireland the devaluation of the licence in the aftermath of de-restriction became a political issue. The government issued compensation to licence holders, albeit based on their individual economic loss.

F QUANTIFYING THE IMPACT OF THE 2003 STUDY

- F.1 OXERA's literature review (2003) states that 'there are relatively few examples of either empirical or theoretical work that has sought to examine consumer welfare in relation to taxi services', which is consistent with our efforts in trying to evaluate consumer benefit as there are few precedents available.
- F.2 However, we have tried to develop a model to quantify the impacts of the 2003 study, and this section explains the quantifications in detail.
- F.3 There are four major steps in our model. First, we use the data from LAs de-restricted recently to calculate the welfare impacts *after* de-restriction, such as the change in waiting time experienced in these LAs. Table A6.1 below lists the de-restricted LAs we have used.

Table A6.1: De-restricted LAs used in our quantification

Licensing Authority	Year of data before de-restriction	Year of de-restriction	Year of data after de-restriction
Cambridge	1999	2000	2003
Cardiff	2001	2005	2007
Sheffield	1998	2000	2007
Wolverhampton	2003	2005	2007

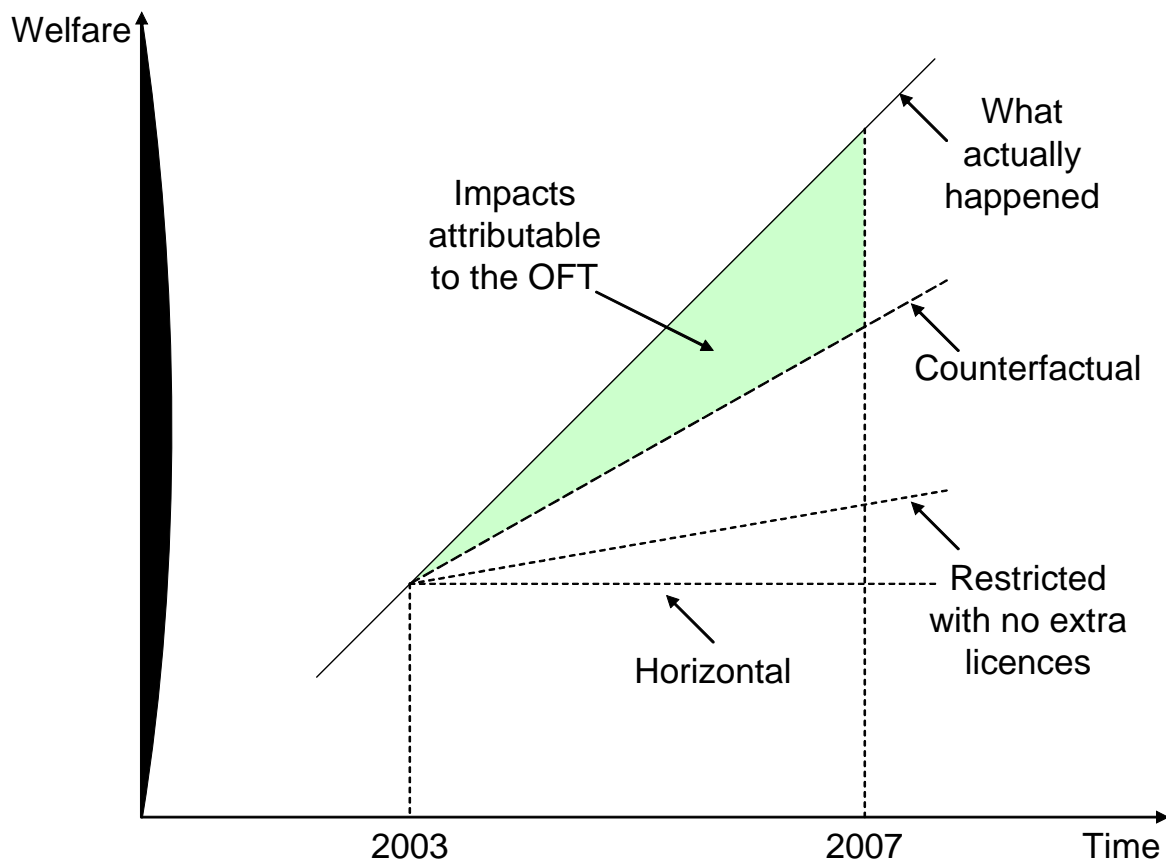
Source: Halcrow and OFT (2003) 'The regulation of licensed taxi and PHV services in the UK'

- F.4 Please note such welfare impacts are different from the welfare impacts *of* de-restriction, because other market or demographic developments would have affected the welfare impacts even in absence of de-restriction.

F.5 Chart 1, which is reproduced below as Chart A6.1, illustrates this distinction. The area between the two lines 'what actually happened' and 'horizontal' are the impacts *after* de-restriction, while the area between the two lines 'what actually happened' and 'restricted with no extra licences' are the impacts *of* de-restriction.⁴⁶ The line 'counterfactual' represents what would have happened if the OFT had not conducted the 2003 study, therefore the area between the line 'counterfactual' and the line 'what actually happened' are the impacts attributable to the OFT.

⁴⁶ Theoretically it could be argued that the effects of de-restriction might be nothing: consider a scenario where a hypothetical LA keeps conducting real-time unmet demand studies which are perfect at predicting supply and demand and issues enough extra licences whenever any unmet demand is found. Under this scenario, the number of taxis will be the same no matter whether the LA imposes quantity restrictions or not. However, this is a very extreme case, and a more realistic and representative scenario, which is also the one we have used in our quantification, would be that the LAs issue no extra licence since the 2003 OFT study. This is consistent with the data from the Department for Transport which shows that, of the 90 LAs in England and Wales that are still restricted nowadays (the response from several LAs to the DfT was not clear enough so was not considered), 63 LAs (for example 70 per cent) have not issued any extra licence since 2003.

Chart A6.1: Counterfactual for LAs de-restricted since 2003



Note: this chart is illustrative only

- F.6 Second, we estimate the welfare impacts *of* de-restriction by subtracting the welfare impacts observed in still restricted LAs (for example the area between the two lines 'restricted with no extra licences' and 'horizontal') from the welfare impacts *after* de-restriction.
- F.7 We use data in seven still restricted LAs for which Halcrow has conducted unmet demand studies around both 2003 and 2007 to understand what has happened in these LAs and to estimate what would have happened in the four de-restricted LAs if they had not de-restricted. Table A6.2 below shows the still restricted LAs we have used.

Table A6.2: Still restricted LAs used in our quantification

Licensing Authority	Year of earliest data	Year of latest data
Blackpool	1998	2006
Bournemouth	2002	2005
Brighton	2002	2006
Hull	2000	2006
Leicester	2001	2005
Thurrock	2003	2006
Wigan	2002	2006

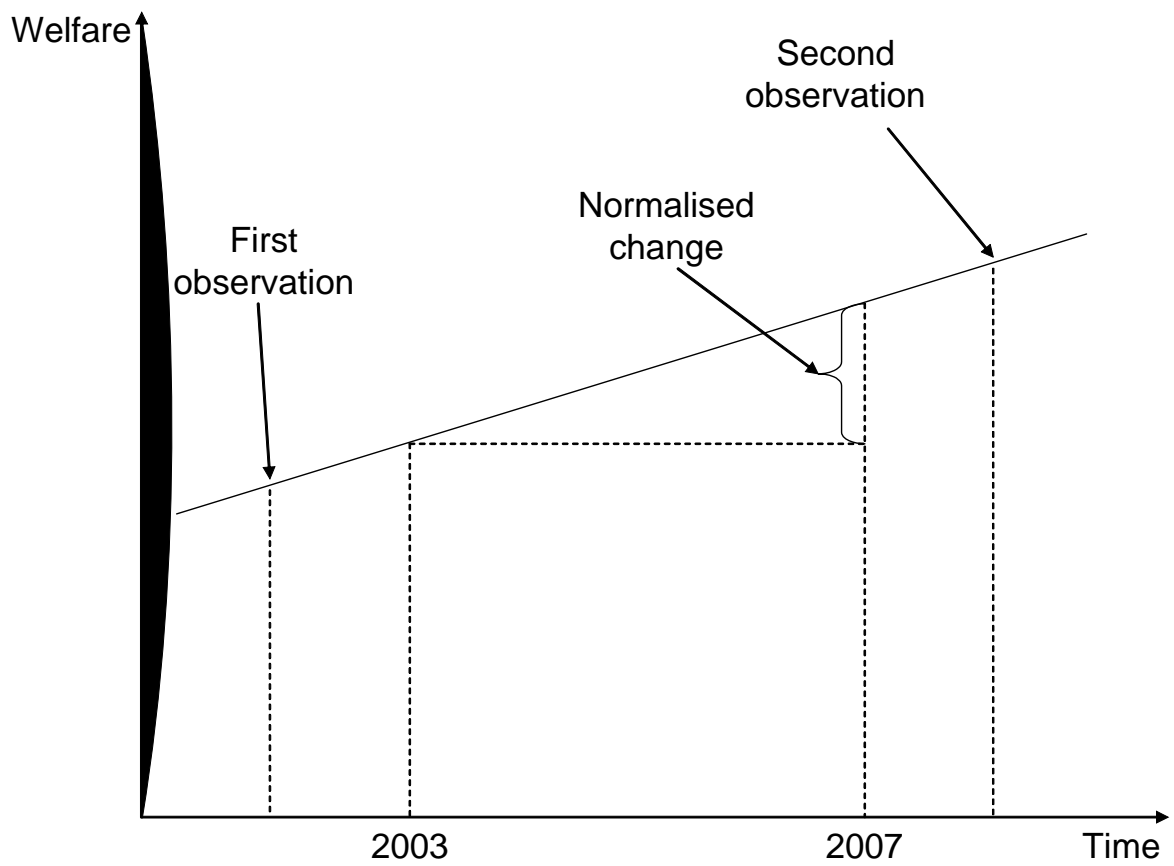
Source: Halcrow

F.8 Because observations in different LAs were made in different years, and different LAs de-restricted in different years as well, we normalised the data to a 4-year period for both restricted and de-restricted LAs. This allows us to present the data for each LA in a comparable form as if: a) in each LA the first observation was made in 2003 and the second one in 2007; and b) de-restriction happened in all de-restricted LAs in 2003.⁴⁷ For restricted LAs, we have assumed a constant speed of change (for example reduction in waiting time) between the two observations. For de-restricted LAs, we have assumed different but constant speeds of change *before* and *after* de-restriction, and we assume that the constant speed before de-restriction would be the same as the average speed of change in restricted LAs.⁴⁸ Chart A6.2 and Chart A6.3 below illustrate the concept.

⁴⁷ We chose a four-year period because the time gap between now and the 2003 study is four years.

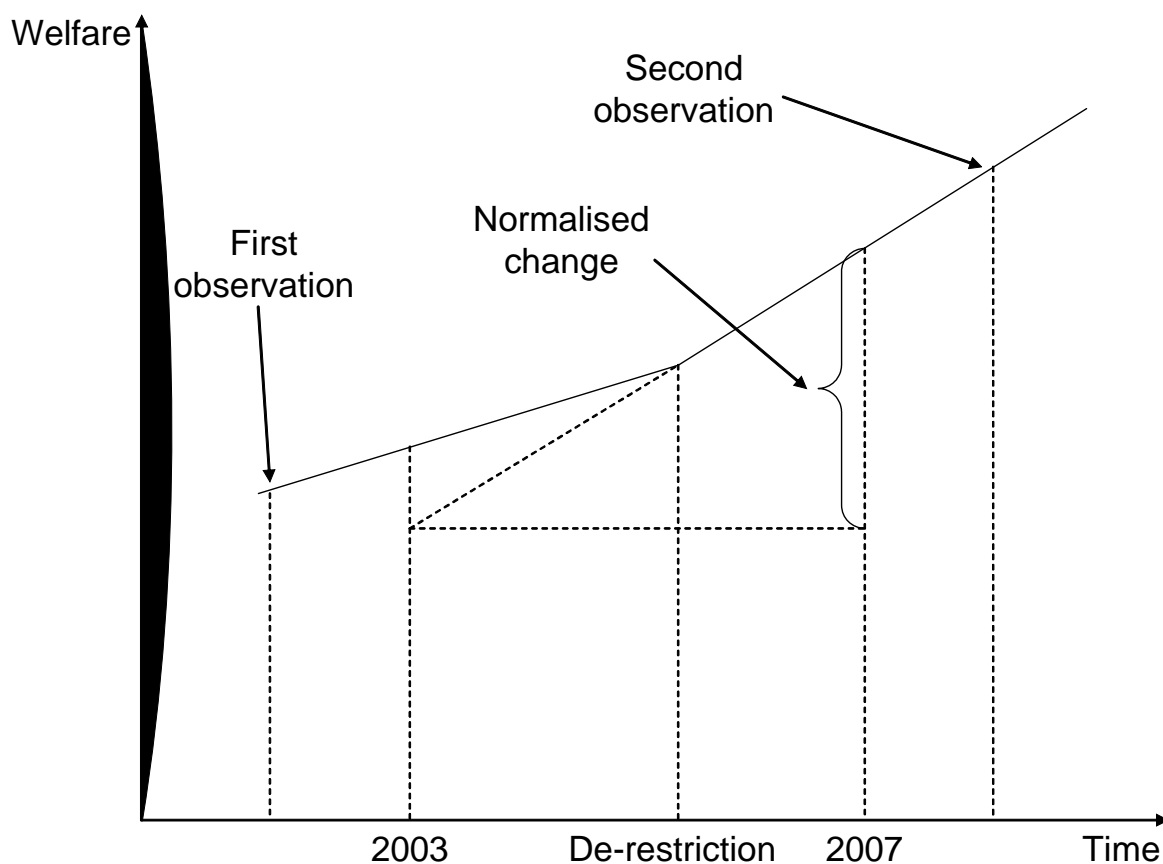
⁴⁸ Risking stating the obvious, this is because de-restricted LAs were restricted before de-restriction.

Chart A6.2: Normalised change for restricted LAs



Note: this chart is illustrative only

Chart A6.3: Normalised change for de-restricted LAs



Note: this chart is illustrative only

- F.9 Third, after estimating the welfare impacts of de-restriction, we apply them to all the LAs that have de-restricted since the 2003 study to estimate *realised* welfare impacts of de-restriction. We also apply them to all the LAs that remain restricted to estimate *potential* welfare impacts of de-restriction if these LAs were to de-restrict in the future. Part of such potential welfare impacts, the potential consumer benefits, would also be the remaining consumer detriment of continued quantity restriction.
- F.10 Fourth, we estimate the part of the realised welfare impacts *attributable* to the OFT by estimating to what extent the 2003 study has led to the decisions on de-restriction.
- F.11 As explained in the conceptual framework, we try to quantify several types of welfare impacts: the consumer benefit from reduction in

passenger waiting time on existing taxi journeys in the street and rank hiring segment, the consumer benefit from more taxi journeys in the same segment, and driver cost increase from increased driver waiting time. The four major steps discussed above apply to all types of welfare impacts.

- F.12 Given the availability of data, we have to make necessary assumptions in our quantifications and, inevitably, face uncertainties on the validity of our assumptions. Otherwise we have to limit the scope of our quantification for the same reason. Generally we have adopted a conservative approach: wherever we need to make assumptions or limit the scope of our quantification, we tried our best to choose the approach biased towards *underestimating* the consumer benefits. We discuss caveats in our quantifications at the end of each quantification model.

Realised and potential consumer benefit from the reduction in passenger waiting time on existing taxi journeys

- F.13 One of the most cited consumer benefits of de-restriction is the reduction in passenger waiting time. Here we quantify the monetary value of both the *actual* reduction in passenger waiting time in the LAs that have de-restricted since 2003 and the *potential* reduction in passenger waiting time in the LAs that remain restricted. The basic formula:

$$\text{Monetary value of reduction in waiting time} = \text{reduction in waiting time per trip} \times \text{total number of trips} \times \text{the monetary value per time unit} \quad (\text{A6.1})$$

- F.14 To make our quantifications more precise, we differentiate between three types of taxi journeys where different monetary values per time unit would be attached to the respective passenger waiting times: commuting, business, and leisure.

Reduction in passenger waiting time per trip

- F.15 First, we calculate the average reduction in passenger waiting time in the four de-restricted LAs. Second, we calculate the average reduction in passenger waiting time in the still restricted LAs. Then we estimate the

average reduction in passenger waiting time per trip *of* de-restriction by subtracting the average reduction in restricted LAs from that in de-restricted LAs. Table A6.3 below presents the result in two scenarios, one assuming the passenger waiting time in all de-restricted LAs would have decreased by the same number of minutes as observed at taxi ranks in our sample, and the other assuming the passenger waiting time in all de-restricted LAs would have decreased by the same percentage as observed at taxi ranks in our sample. Note that the results of this difference in difference analysis are indistinguishable from zero at a 75 per cent confidence interval.

Table A6.3: Reduction in passenger waiting time

	Street hailing (minutes)	Rank hiring (minutes)
Scenario 1: absolute reduction ^a	0.13	0.13
Scenario 2: relative reduction ^b	0.86	0.48

a: assuming the passenger waiting time in all de-restricted LAs would have decreased by the same number of minutes as observed at taxi ranks in our sample;

b: assuming the passenger waiting time in all de-restricted LAs would have decreased by the same percentage as observed at taxi ranks in our sample.

Source: Europe Economics calculation

F.16 It could be seen that there are significant differences in the results under these two scenarios. Moreover, even the reductions in passenger waiting time at taxi ranks are different under the two scenarios. The main reason is that the observed initial passenger waiting times in the de-restricted LAs in our sample (ranging from 0.80 minute in Cardiff to 2.29 minute in Cambridge) are significantly lower than the average in all restricted LAs in 2003 (8.83 minute on streets and 4.94 minute at taxi ranks).

Total number of trips

F.17 We are interested in the total number of taxi trips, in 2003,⁴⁹ in the street and rank hiring segment in the following two groups of LAs: those de-restricted since 2003 and those still remaining restricted.

⁴⁹ We are interested in the number of taxis in 2003 because we would like to quantify the impact on *existing* trips. The benefit arising from additional taxi journeys are discussed and quantified separately.

F.18 The 2005 National Travel Survey, which is the last one published, reports that, in 2002 the average number of taxi/PHV trips per adult per year in the UK in 2005 was 12.⁵⁰ We used this estimate, combined with the most recent ONS data on population to calculate the total number of taxi/PHV trips. To be coherent with the definition of the National Travel Survey, we have used only the adult population (i.e. people who are older than 16).

F.19 Having calculated the total trips in question, we then divided them by hiring method: street, rank, and telephone. The share and total number of each type of taxi trips in the restricted and de-restricted LAs are shown in Table A6.4 below.⁵¹

Table A6.4: Share and annual number of trips by hiring method in 2003

	Street hailing	Rank hiring	Telephone booking	Total
Share of trip by purpose	13.2%	31.3%	55.6%	100%
Total annual number of trips in LAs de-restricted since 2003	7,850,304	18,614,736	33,066,432	59,531,472
Total annual number of trips in LAs still restricted	22,531,608	53,427,222	94,905,864	170,864,694

Source: OFT (2003) 'The regulation of licensed taxi and PHV services in the UK' and Europe Economics calculations

F.20 There are reasons to believe that this chart is biased downwards as the national Trade Survey is based solely on UK resident households. Therefore trips of tourists and other foreign visitors and of students

⁵⁰ Available online at

www.dft.gov.uk/pgr/statistics/datatablespublications/personal/mainresults/nts2005/

⁵¹ The DfT provided us with the distribution of taxi and PHV trips by trip start time and purpose for the period 2002 – 2005. There are two different purposes: 'leisure' and 'commuting and business', and 25 possible starting times for the trip: the 24 hours of the day plus a 'not available category' category. However, the data do not distinguish between business and commuting trips within the same category. However, as we will see in the following paragraphs, these types of trips should be valued very differently. The DfT advised us that the share of business trips within this category is roughly 25 per cent. We have used this assumption to distinguish between these two categories.

living in halls of residence are not included in this estimate. This means the benefits calculated from these charts would be biased downwards as well.

- F.21 We were not able to estimate the magnitude of the bias, given that we are not aware of estimates of the number of taxi trips of foreign residents and tourists. Nevertheless, this bias is consistent with our general conservative approach.

The monetary value of time

- F.22 The DfT has published in February 2007 the latest version of its Transport Analysis Guidance⁵² that provides data on the monetary value of time for different categories of modes of transport and for different purposes of the trip.
- F.23 The value of working time varies according to the mode of transport while this is not the case for the value of leisure time.⁵³ For taxi/PHV passengers the market value of one hour of working time in 2002 prices is equal to £44.69, and the market value of time for commuting and leisure trips is respectively £5.04 and £4.46 in 2002 prices.
- F.24 The DfT recommends that the value of non working time (both commuting and leisure) spent waiting for public transport is two and a half times the base values. Therefore we adjusted the market value of time (for commuting and leisure trips only) by a factor of 2.5.
- F.25 The final adjustment, that is necessary for all three categories of trips, relates to inflation. The values reported above are in 2002 prices, and we have used the CPI to scale up the charts to 2007 prices. Table A6.5 below presents the monetary value of per hour waiting time for the three types of taxi trips.

⁵² Available at www.webtag.org.uk

⁵³ See Unit 3.5.6 of the Transport Analysis Guidance for details.

Table A6.5: Monetary value of per hour passenger waiting time (2007 price)

Type of taxi trip	Monetary value of per hour waiting time (£)
Commuting	13.51
Working	47.92
Leisure	11.96
Weighted average ^a	13.48

*a: weighted by the share of each hiring method as presented in Table A4.1
Source: Department for Transport and Europe Economics calculation*

F.26 The overall result is consistent with that found by OXERA's consumer survey in the 2003 study, which suggested 20 pence per minute (for example £12 per hour) as the central estimation of waiting time.⁵⁴

Results

F.27 Table A6.6a and Table A6.6b below presents the results of our calculation under the two scenarios.

Table A6.6a: Annual consumer benefit from reduction in passenger waiting time (Scenario 1^a)

	Street hailing	Rank hiring	Total
Annual realised benefit in LAs which have de-restricted since 2003 (£)	228,812	542,563	771,375
Annual potential benefit in LAs which have remained restricted (£) ^b	656,727	1,557,240	2,213,967

a: assuming the passenger waiting time in all de-restricted LAs would have decreased by the same number of minutes as observed at taxi ranks in our sample;

b: this is also remaining consumer detriment.

Source: Europe Economics calculation

⁵⁴ Annexe I, Office of Fair Trading (2003) 'The regulation of licensed taxi and PHV services in the UK'.

Table A6.6b: Annual consumer benefit from reduction in passenger waiting time (Scenario 2^a)

	Street hailing	Rank hiring	Total
Annual realised benefit in LAs which have de-restricted since 2003 (£)	1,516,670	2,011,999	3,528,669
Annual potential benefit in LAs which have remained restricted (£) ^b	4,353,081	5,774,753	10,127,835

a: assuming the passenger waiting time in all de-restricted LAs would have decreased by the same percentage as observed at taxi ranks in our sample;

b: this is also remaining consumer detriment.

Source: Europe Economics calculation

Caveat

F.28 One caveat of our quantification above that we would like to highlight is that, in calculating the reduction in passenger waiting time, we fully rely on data from taxi rank observations. This could lead to two possible and opposite biases. First, if the reduction in waiting time on the street is *smaller* than that at taxi ranks, then our estimation would *overestimate* the consumer benefits; second, if the reduction in waiting time on the street is *bigger* than that at taxi ranks, then our estimation would *underestimate* the consumer benefits. We have no evidence on the direction of this potential bias; however, we feel the second possibility is more plausible. This is because taxi ranks are normally the focal points of taxi services and relatively well served, also the limited rank spaces would put a cap on the number of extra taxis that could serve the ranks. Therefore it's likely that the reduction of waiting time on the street is higher than that at taxi ranks.

Realised and potential consumer benefit from additional taxi journeys

F.29 As explained in our conceptual framework, the two main types of consumer benefit from de-restriction are: first, the reduction of waiting time on *existing* taxi journeys in the street and rank hiring segment, and second, the benefit from *additional* taxi journeys in this segment. In this sub-section, we quantify the second type of benefits. Some of the additional taxi journeys in the street and rank hiring segment were the taxi journeys that would have been pre-booked if de-restriction had not

taken place (i.e. switch between hiring methods), and others will be entirely new taxi journeys. Arguably these two types of additional taxi journeys may present different consumer benefit; however, due to data availability, we assume that the consumer benefit from each entirely new taxi journey will be the same as each taxi journey switched from pre-booking.

F.30 The consumer benefit arising from additional taxi journeys in the taxi and rank hiring segment is that consumers are enjoying better services – consumers must enjoy higher utility, otherwise they would have not switched from using other transportation modes (or doing other things) to hiring a taxi on the street or at taxi ranks.

F.31 On the other hand, such consumer benefits may be limited by the potential higher price if they take a taxi on the street or at taxi ranks.

F.32 Therefore we want to calculate net consumer benefit:

$$\text{The net consumer benefit} = \text{utility differential} - \text{price differential} \quad (\text{A6.2})$$

F.33 Then the total net consumer benefit:

$$\text{Total consumer benefit from additional taxi services} = \text{net consumer benefit per taxi journey} \times \text{total number of additional journeys hailed on the street or at the rank} \quad (\text{A6.3})$$

Utility differential

F.34 There may be different sources for higher utility by hiring a taxi on the street or at the rank: lower waiting time compared with booking a taxi by telephone, convenience, no need for using a telephone (if you don't have a mobile at hand!), etc. However, due to data availability, we only quantify the benefit arising from the lower waiting times on the taxi journeys where consumers switch from pre-booking to street and rank hiring.

F.35 Please note that this is conceptually different from the monetary value of reduction in waiting that we have quantified above: what we did above was to quantify the benefit arising from reduction of waiting time on

existing taxi journeys hired from the street or at taxi ranks, while what we are doing here is to quantify the benefit arising from the waiting time reduction on *additional* taxi journeys hired on the street or at taxi ranks which consumers would have pre-booked in absence of de-restriction.

F.36 Table A6.7 below shows the average waiting time in restricted LAs according to hiring method. The resulting utility differential comes from the waiting time differential between telephone booking and the other two hiring methods. The waiting time differential includes both the existing differential between the hiring methods and the further reduction in waiting time arising from de-restriction.

Table A6.7: Waiting time by hiring method in restricted LAs

	Street hailing	Rank hiring	Telephone booking
Average passenger waiting in 2003 (minutes)	8.83	4.94	10.62
Existing passenger waiting time differential (minutes) ^a	1.79	5.68	-
Extra reduction in passenger waiting time from de-restriction (minutes) (Scenario 1 ^b)	0.13	0.13	-
Utility differential (Scenario 1 ^b)	£0.43	£1.31	-
Extra reduction in passenger waiting time from de-restriction (minutes) (Scenario 2 ^c)	0.86	0.48	-
Utility differential (Scenario 2 ^c)	£0.60	£1.38	-

a: compared with average waiting time of telephone booking;

b assuming the passenger waiting time in all de-restricted LAs would have decreased by the same number of minutes as observed at taxi ranks in our sample;

c: assuming the passenger waiting time in all de-restricted LAs would have decreased by the same percentage as observed at taxi ranks in our sample.

Source: Table 3.8 of Annexe C, Office of Fair Trading (2003) 'The regulation of licensed taxi and PHV services in the UK', Europe Economics calculation

Price differential

F.37 As explained in our conceptual framework, in the street and rank hiring segment, taxi drivers have little incentive to offer discounts to customers and the regulated maximum level of fares are normally the actual level of fares charged in practice. On the other hand, the fares of PHVs are not regulated and they could enter the pre-booking segment and compete with taxis freely, which would lead to a quality-adjusted fare level lower

than the regulated maxima.⁵⁵ In addition, at peak times, when both taxis and PHVs are in short supply and so consumers cannot effectively shop around, PHVs have the flexibility to charge higher prices than taxis as they are not constrained by fare regulations.

F.38 There is no data on the actual fare level in the pre-booking segment, so we have to use the profit differential per journey as a proxy for the price differential per journey. The profit differential could be calculated from the licence premium: that people are willing to pay a premium for taxi vehicle licence (compared with PHV vehicle licence) is because they expect to earn higher profit annually when operating in the street and rank hiring segment where supply in that segment is limited by quantity restriction. If we regard the licence premium as the net present value (NPV) of all future annual excess profits, then we can calculate the annual excess profit per taxi from licence premium:

$$\text{Annual excess profit per taxi} = \text{licence premium} \times (\text{discount rate} - \text{growth rate})$$

(A6.4)

F.39 We could then calculate the profit differential per journey from the annual excess profit per taxi:

$$\text{Profit differential per journey} = \text{Annual excess profit per taxi} / \text{total number of journeys per taxi in the street and rank hiring segment}$$

(A6.5)

F.40 We have two sources of licence premium data, Taxi Driver Online and our LA survey. These two sources yielded two different but similar estimates on the weighted average⁵⁶ licence premium per taxi: £33,635 by Taxi Driver Online⁵⁷ and £29,753 by our LA survey. We use,

⁵⁵ If the quality-adjusted fare level in the pre-booking segment is higher than the regulated maxima for taxis, then all taxi drivers will have incentive to convert their taxi vehicle and driver licence to PHV vehicle and driver licence because they could earn more by driving a PHV. We have so far not been aware of any evidence in any LAs suggesting such an effect, which means we could reasonably conclude that quality-adjusted fares in the pre-booking segment are lower than that in the street and rank hiring segment.

⁵⁶ Weighted by the number of taxi vehicles in each restricted LA which has reported on licence premium.

⁵⁷ <http://taxi-driver.co.uk/quota.html>

£31,694, the average of these two estimates in our calculation.

Equation A6.5 above is equivalent to:⁵⁸

$$\text{Profit differential per journey} = \frac{\text{Licence premium per taxi} \times \text{total number of taxis} \times \text{discount rate}}{\text{total number of journeys in the street and rank hiring segment}}$$

(A6.6)

- F.41 To calculate the total number of taxis in LAs restricted in 2003, we multiply the population in these LAs by 0.94, the number of taxis per 1,000 people.⁵⁹ For the purpose of our calculation, we use growth rate of annual excess profit of five per cent⁶⁰ and discount rate of 15 per cent.⁶¹
- F.42 Our calculation shows that the profit differential per trip – and also the price differential per trip for the purpose of our calculation – is £0.56. However, it seems that this would overestimate the price differential (and therefore underestimate consumer benefit) because the utilisation rate of taxis is higher due to quantity restrictions.

⁵⁸ Annual excess profit per taxi = licence premium per taxi x discount rate

⁵⁹ Annexe B, Office of Fair Trading (2003) 'The regulation of licensed taxi and PHV services in the UK'

⁶⁰ Arguably the growth rate of excess profit would be in line with that of regulated fare, which in the UK grew on average 5 per cent annually from 1999 to 2007.

⁶¹ We failed to find any literature on the proper discount rate for investment on taxi vehicles and licences. However, two previous papers, Taylor (1989) and Australian Productivity Commission (1999), shed light on the difference between discount rate and growth rate. They used 14 per cent and 6.7 per cent for the difference between the discount rate and growth rate, respectively. The latter figure is more plausible, given it was derived from licence premium and the annual lease of licence (which presumably well reflects the annual excess profit). We use 10 per cent as the average of these two figures. Adding up the five per cent growth rate we have assumed, we got 15 per cent discount rate. This is comparable with the normal discount rate used on equity investment. Furthermore, the Australian Productivity Commission explained the seemingly low discount rate as 'owner-drivers may be willing to pay more for a taxi plate than could be justified purely in investment terms because they consider that plate ownership guarantees them employment and control over their work ('buying a job')'.

Net consumer benefit per journey

F.43 Therefore the net consumer benefit per journey could be estimated according to Equation A6.2. Table A6.8 below presents the result.

Table A6.8: Net consumer benefit per trip from switching hiring method

	Street hailing	Rank hiring
Utility differential per trip (Scenario 1 ^a)	£0.43	£1.31
Utility differential per trip (Scenario 2 ^b)	£0.60	£1.38
Price differential per trip	£0.56	£0.56
Net consumer benefit per trip (Scenario 1 ^a)	£0.00 ^c	£0.75
Net consumer benefit per trip (Scenario 2 ^b)	£0.04	£0.83

a: assuming the passenger waiting time in all de-restricted LAs would have decreased by the same number of minutes as observed at taxi ranks in our sample;

b: assuming the passenger waiting time in all de-restricted LAs would have decreased by the same percentage as observed at taxi ranks in our sample;

c: negative values are replaced by zero because consumer benefit from switching must be non-negative, otherwise switching would not have happened.

Source: Europe Economics calculation

F.44 One issue needs discussion is that we have replaced the calculated negative consumer benefit with zero. This is because consumer benefit from switching must be non-negative (otherwise switching would not have happened) and the negative figures calculated are most likely due to the fact that we have omitted other potential consumer benefits.

Total number of additional journeys

F.45 As explained above, there are two sources of additional taxi journeys in the street and rank hiring segment: those switched from the pre-booking segment and the entirely new ones.

F.46 To calculate the number of additional taxi journeys switched from the pre-booking segment, similar to calculating the reduction in waiting time on existing journey, we use the changes in the share of different hiring methods in the recently de-restricted LAs and still restricted LAs presented in Table A6.1 and A6.2.

F.47 First, we calculate the average increase in share of the taxi journeys hired on the street or at taxi ranks in the four de-restricted LAs. Second, we calculate the average increase in share of the taxi journeys hired on the street or at taxi ranks in the still restricted LAs. Then we estimate the average increase in share of the taxi journeys hired on the street or at taxi ranks *of* de-restriction by subtracting the average increase in restricted LAs from that in de-restricted LAs. Table A6.9a, A6.9b, and A6.9c below present the result.

Table A6.9a: Change in the share of street hailing

	Share (%)		Change in share (%)
	Initial observation	Recent observation	
De-restricted LAs:			
Cambridge	9	30	21
Cardiff	19	18	-1
Sheffield	7	44	37
Wolverhampton	23	27	4
Average ^a	N/A	N/A	3
Restricted LAs: ^b			
Blackpool	5	22	17
Brighton	18	24	6
Hull	14	28	14
Leicester	18	38	20
Thurrock	2	12	10
Average ^a	N/A	N/A	12
Difference	N/A	N/A	-9

a: normalised by the number of years between observations and weighted by the population in each LA;

b: data on share of each hiring method in Bournemouth and Wigan are not available;

Source: Halcrow and Europe Economics calculation

Table A6.9b: Change in the share of rank hiring

	Share (%)		Change in share (%)
	Initial observation	Recent observation	
De-restricted LAs:			
Cambridge	27	37	10
Cardiff	20	27	7
Sheffield	34	17	-17
Wolverhampton	32	34	2
Weighted average ^a	N/A	N/A	2
Restricted LAs: ^b			
Blackpool	31	51	20
Brighton	39	26	-13
Hull	23	20	-3
Leicester	24	38	14
Thurrock	50	40	-11 ^c
Weighted average ^a	N/A	N/A	0
Difference	N/A	N/A	2

a: normalised by the number of years between observations and weighted by the population in each LA

b: data on share of each hiring method in Bournemouth and Wigan are not available

c: rounding error

Source: Halcrow and Europe Economics calculation

Table A6.9c: Number of annual additional trips from switching

	Street hailing	Rank hiring	Total
Realised change in LAs which have de-restricted since 2003	-692,396	446,757	-245,639
Potential change in LAs which have remained restricted	-1,987,286	1,282,264	-705,022

Source: Europe Economics calculation

F.48 The calculated total number of annual additional trips arising from switching from the pre-booking segment is, counter-intuitively, negative. The main cause is that the shares of street hailing in Cardiff and Wolverhampton, both of which were newly de-restricted, did not increase as much as those in Cambridge and Sheffield, both of which de-restricted before 2003 (the share of street hailing in Cardiff did indeed decrease). We believe this may be due to the fact that, after de-

restriction, it takes time for people to realise that the waiting time on street is lower, which means it takes time for the share of street hailing to increase to the long-term equilibrium level. Indeed, if the share of street hailing in Cardiff and Wolverhampton were to increase by the same percentage points as in Cambridge and Sheffield, the number of additional taxi hired on streets will be positive. Note that the results of this difference in difference analysis are indistinguishable from zero at a 75 per cent confidence interval.

F.49 To calculate the number of entirely new additional journeys, we use the demand elasticity with respect to waiting time estimated by Flores-Guri (2003), which is -0.47. We estimate that passenger waiting time at taxi ranks has reduced by around 10 per cent due to de-restriction and, for the purpose of estimating additional taxi journeys, we assume passenger waiting time on the street would fall by the same percentage. This leads to 4.6 per cent entirely new taxi journeys in the street and rank hiring segment. Table 6.9d and 6.9e below presents the number of entirely new taxi journeys in the street and rank hiring segment and the total number of additional taxi journeys in this segment.

Table A6.9d: Number of annual entirely new trips

	Street hailing	Rank hiring	Total
Realised change in LAs which have de-restricted since 2003	359,298	851,973	1,211,271
Potential change in LAs which have remained restricted	1,031,243	2,445,296	3,476,540

Source: Europe Economics calculation

Table A6.9e: Total number of annual additional trips

	Street hailing	Rank hiring	Total
Realised change in LAs which have de-restricted since 2003	-333,098	1,298,730	965,633
Potential change in LAs which have remained restricted	-956,042	3,727,560	2,771,518

Source: Europe Economics calculation

F.50 The results show that the total number of taxi journeys hired on streets or at taxi ranks would increase because of de-restriction, although the number of taxi journeys hired on the streets has decreased.

Results

F.51 Table A6.10 below presents the results of our calculation.

Table A6.10: Annual consumer benefit from additional trips

	Street hailing (£)	Rank hiring (£)	Total (£)
Annual realised benefit in LAs which have de-restricted since 2003 (Scenario 1 ^a)	0	970,732	970,732
Annual potential benefit in LAs which have remained restricted (Scenario 1 ^a) ^c	0	2,786,153	2,786,153
Annual realised benefit in LAs which have de-restricted since 2003 (Scenario 2 ^b)	-12,483	1,073,253	1,066,769
Annual potential benefit in LAs which have remained restricted (Scenario 2 ^b) ^c	-35,829	3,080,405	3,044,575

a: assuming the passenger waiting time in all de-restricted LAs would have increased by the same number of minutes as observed at taxi ranks in our sample;

b: assuming the passenger waiting time in all de-restricted LAs would have increased by the same percentage as observed at taxi ranks in our sample;

c: this is also remaining consumer detriment.

Source: Europe Economics calculation

Caveats

F.52 There are a several caveats in our quantification that we would like to highlight.

F.53 First, we analyse waiting time differential only in calculating utility differential, which might *underestimate* the consumer benefit from switching from pre-booking to street or rank hiring, since pre-booking may be inferior in other aspects as well. For instance, consumers may have to incur extra telephone costs if they are not at home or in the office and don't have a mobile at hand. Otherwise they may not know the precise address of their current place and destination, making explaining where to go and how to pick them up a headache (this is particularly true of tourists). This caveat is particularly evident in calculating the consumer benefit of switching from telephone booking to street hailing.

- F.54 Second, we have used profit differential as a proxy for price differential. This might under- consumer benefit, as operating cost may be higher in the pre-booking segment because of the higher utilisation rate of taxis arising from quantity restriction.
- F.55 Third, the estimates of the value completely new journeys, and of additional trips from switching, are based on estimates of the impact of de-restriction on waiting times, and on the market shares of different segments, respectively. Since these inputs are statistically indistinguishable from zero at a 75 per cent confidence level, the estimates of impact that they generate must also be treated with considerable caution.

Realised and potential increased costs from de-restriction

- F.56 Having estimated above realised and potential consumer benefits of de-restriction, now we turn to estimate the realised and potential increased costs from de-restriction.

Concept

- F.57 There are some sources of cost increase suffered by *existing* taxi drivers when de-restriction take place: they may earn less since more taxis enter the market, as a result they may have to work longer (and sometimes unsocial) hours to mitigate the reduction in income, and they would lose the re-sale value of their taxi vehicle licence if they decide to quit the trade. If this cost increase is greater than the benefit enjoyed by consumers from de-restriction then productive efficiency has decreased: the increase in costs to the industry is less than the increase in benefits for consumers.
- F.58 However, arguably the reduction of income and the increase of working hours are already reflected in the disappearance of licence premium. As discussed above, licence premium reflects the net present value of all future excess profit of operating a taxi vehicle. However, after de-restriction, any excess profit will be competed away by new entrants. Because the regulated fare level does not change, such disappearance of excess profit will be in the form of longer driver waiting time, higher

fixed cost (because of more taxi vehicles in operation), and lower revenue per taxi.

- F.59 Therefore we use the total licence premium before de-restriction as one basis for estimating the increase in taxi driver cost from de-restriction. To make it comparable to our estimated annual consumer benefit, we calculate the annual taxi driver cost increase based on Equation A6.7 below, which comes from Equation A6.4:

$$\text{Annual taxi driver cost increase} = \text{number of taxis} \times \text{licence premium} \times (\text{discount rate} - \text{growth rate})$$

(A6.7)

- F.60 One view of the licence premium is that it represents a monopoly rent enjoyed by taxi drivers protected by quantity restriction and therefore that no weight should be attached to the loss of licence premium in policy consideration. However, as explained in Annexe 4, de-restriction coupled with the same level of regulated fares will result in lower passenger waiting time and higher driver waiting time (i.e. lower utilisation rate). Therefore, in the context of street and rank hiring with regulated price and compared to new entrants once de-restriction takes place, licence premium arises not from higher prices but from a higher utilisation rate. The loss of licence premium on de-restriction reflects increased costs and should be taken into account in policy considerations. The outcome could be different if de-restriction was accompanied by a reduction in regulated fares. However we have found no evidence that such a change has occurred.

Result

- F.61 We have already explained the calculations of total licence premium in restricted LAs above from Paragraph F.38 to Paragraph F.41. The results are presented in Table A6.11 below.

Table A6.11: Annual driver cost increase of de-restriction (Scenario 3)

Annual increased cost per driver	£3,169
Realised total annual driver cost increase in LAs which have de-restricted since 2003	£14,765,039
Potential total annual driver cost increase in LAs which have remained restricted	£42,377,986

Source: Europe Economics calculation

Driver's increased costs calculated from the increase of driver waiting time

F.62 We also calculated drivers' increased cost from the increase of driver waiting time as an alternative to our calculations based on licence premium. This can be thought of as a direct loss in driver productive efficiency. Table A6.12 below presents the results.

Table A6.12: Increase in driver waiting time per trip

	Street hailing	Rank hiring
Increase in driver waiting time per trip (minutes)	5.22	5.22

Source: Europe Economics calculation

F.63 We have not found any evidence on the monetary value of driver waiting time. However, it's likely that the actual monetary value of driver waiting time lies between the minimum wage in the UK⁶² and the monetary value of passenger waiting time. Table A6.13a and Table A6.13b below presents the results of our calculation under two scenarios using the monetary value of passenger time and the minimum wage as a proxy for the monetary value of driver waiting time, respectively.

⁶² Currently £5.35 per hour.

Table A6.13a: Annual driver cost increase from increase in driver waiting time (Scenario 4^a)

	Street hailing	Rank hiring	Total
Annual realised driver cost increase in LAs which have de-restricted since 2003	£9,198,728	£21,812,136	£31,010,865
Annual potential driver cost increase in LAs which have remained restricted	£26,401,798	£62,604,265	£89,006,063

*a: assuming the monetary value of driver waiting time equals that of passenger waiting time
Source: Europe Economics calculation*

Table A6.13b: Annual driver cost increase from increase in driver waiting time (Scenario 5^a)

	Street hailing	Rank hiring	Total
Annual realised driver cost increase in LAs which have de-restricted since 2003	£3,650,543	£8,656,212	£12,306,755
Annual potential driver cost increase in LAs which have remained restricted	£10,477,633	£24,844,691	£35,322,325

*a: assuming the monetary value of driver waiting time equals the minimum wage in the UK
Source: Europe Economics calculation*

F.64 It can be seen that the results under Scenario 3 is higher than the annual driver cost increase estimated above from licence premium data, while the results under Scenario 4 is lower than the annual increase in drivers' costs estimated above from licence premium data. Given that the actual annual increase in drivers' costs from increase driver waiting time would most likely lie between the results under these two scenarios, it seems that our estimations on driver cost increase from both licence premium data and driver waiting time data are consistent with each other.

Realised welfare impacts attributable to the OFT 2003 study

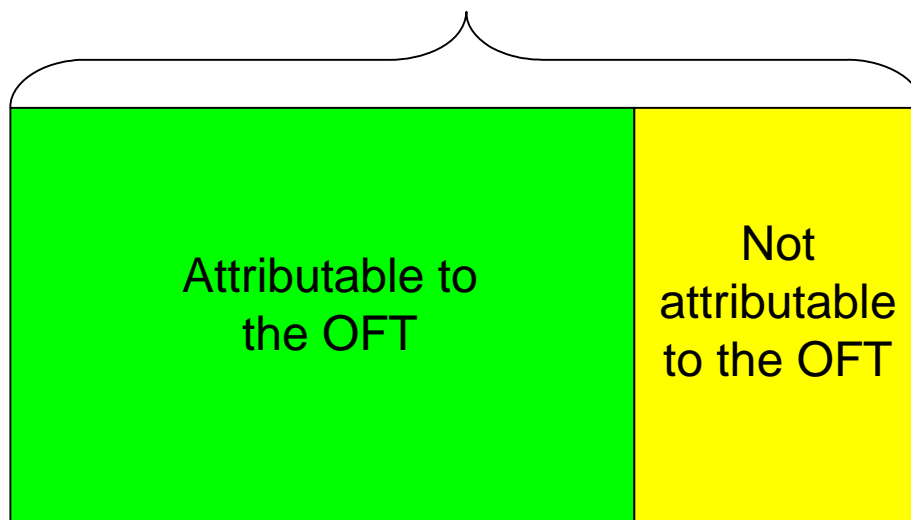
F.65 Having estimated above realised and potential welfare impacts *of* de-restriction, now we turn to estimate the welfare impacts *attributable* to the OFT 2003 study.

Concept

F.66 Chart A6.2 below illustrates the relationship between the realised welfare impacts and those attributable to the OFT. Please note we have estimated above the realised welfare impacts of de-restriction, which include all types of the welfare impacts that we have estimated, including those from the reduction in passenger waiting time, those from switching between hiring methods, and those from the increase of driver waiting time.

Chart A6.4: Realised welfare impacts attributable to the OFT

Realised welfare impacts of de-restriction in LAs de- restricted since 2003



Note: this chart is illustrative only

F.67 In LAs de-restricted since 2003, part and only part of the realised welfare impacts arising from de-restriction would be attributable to the OFT because: on one hand, the LAs in question may not have de-restricted if the OFT had not issued the 2003 study; on the other hand, there may have been other factors that contributed to the decisions of de-restriction in these LAs.

Attribution

F.68 First of all, we present in Table A6.14 below the summary of the various welfare impacts of de-restriction that we have estimated, including both consumer benefits and driver cost increase, under various combinations of scenarios. These scenarios are:

- Scenario 1: passenger waiting time will reduce by the same number of minutes as observed at taxi ranks in our sample due to de-restriction
- Scenario 2: passenger waiting time will reduce by the same percentage as observed at taxi ranks in our sample due to de-restriction
- Scenario 3: driver cost increase is calculated from the licence premium
- Scenario 4: driver cost increase is calculated from driver waiting time and assuming the monetary value of driver waiting time equals the monetary value of passenger waiting time
- Scenario 5: driver cost increase is calculated from driver waiting time and assuming the monetary value of driver waiting time equals the UK minimum wage.

Table A6.14: Summary of impacts on productive efficiency (£)

	Scenario 1			Scenario 2		
	Scenario 3	Scenario 4	Scenario 5	Scenario 3	Scenario 4	Scenario 5
Consumer benefit from reduction in waiting time	771,375	771,375	771,375	3,528,669	3,528,669	3,528,669
Consumer benefit from additional taxi journeys	970,732	970,732	970,732	1,060,769	1,060,769	1,060,769
Combined consumer benefit	1,742,107	1,742,107	1,742,107	4,589,438	4,589,438	4,589,438
Driver cost increase	-14,765,039	-31,010,865	-12,306,755	-14,765,039	-31,010,865	-12,306,755
Total quantified ^a	-13,022,932	-29,268,758	-10,564,649	-10,175,601	-26,421,427	-7,717,317

*a: the sum of all the three quantified welfare impacts excluding those un-quantified and therefore not representing overall welfare impacts
Source: Europe Economics calculation*

Results

- F.69 To estimate the realised welfare impacts attributable to the OFT, we need to estimate to what extent the de-restrictions since 2003 were caused by the OFT.
- F.70 We asked licensing authorities to identify the most important factors influencing their licensing decisions and in particular the overall influence of the OFT study. It is found that, for LAs which de-restricted since 2003, the OFT study is the second most important factor (after the threat or result of litigations) and has an overall importance of eight out of a scale of 10.
- F.71 However, it is difficult to quantify the contribution of the OFT 2003 study to the de-restriction decisions, since, as discussed in our

conceptual framework, various factors have influenced the LAs' decisions may inter-react and are not mutually exclusive.

F.72 Therefore we feel it is difficult to assign a single number but it may be reasonable to attribute between one half and three quarters of all the impacts of de-restriction to the OFT. The results are presented below in Table A6.15.

Table A6.15: Summary of impacts on productive efficiency attributable to the OFT (£)^a

Attribution rate ^b	Scenario 1			Scenario 2		
	Scenario 3	Scenario 4	Scenario 5	Scenario 3	Scenario 4	Scenario 5
50%						
Consumer benefit	871,053	871,053	871,053	2,294,719	2,294,719	2,294,719
Driver cost	-7,382,519	-15,505,432	-6,153,378	-7,382,519	-15,505,432	-6,153,378
Overall	-6,511,466	-14,634,379	-5,282,324	-5,087,800	-13,210,713	-3,858,659
75%						
Consumer benefit	1,306,580	1,306,580	1,306,580	3,442,079	3,442,079	3,442,079
Driver cost	-11,073,779	-23,258,149	-9,230,067	-11,073,779	-23,258,149	-9,230,067
Overall	-9,767,199	-21,951,569	-7,923,486	-7,631,707	-19,816,070	-5,787,988

a: the sum of all the three quantified impacts on productive efficiency excluding those un-quantified and therefore not representing overall impacts on productive efficiency

b: the rate at which the realised welfare impacts could be attributed to the OFT

Source: Europe Economics calculation

Summary

Sensitivity analysis

F.73 We have made a number of important assumptions in our quantification of the welfare impacts of de-restriction. Table A6.16 summarises the main assumptions that we have made assumptions and the related issues.

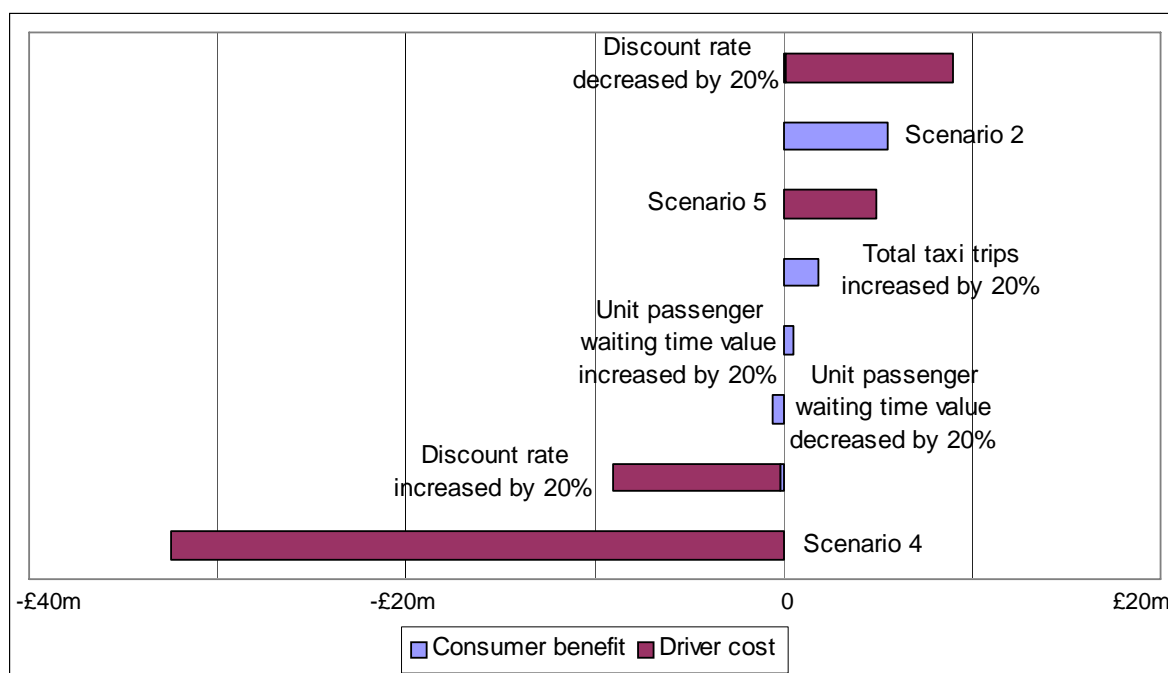
Table A6.16: Main assumptions

Issues	Assumptions made
Change in passenger waiting time in all 48 LAs de-restricted since 2003	Scenario 1: the same number of minutes as observed at taxi ranks in our sample; Scenario 2: the same percentage as observed at taxi ranks in our sample.
Monetary value of passenger waiting time	Figures from the Department for Transport
Change in driver waiting time in all 48 LAs de-restricted since 2003	The same number of minutes as observed at taxi ranks in our sample Scenario 3: the annual excess profit implied by the licence premium
Annual cost increase of existing taxi drivers	Scenario 4 : monetary value of the increase in driver waiting time, based on values for passenger waiting time; Scenario 5: monetary value based on the minimum wage.
Discount rate of annual excess profit	15%
Growth rate of annual excess profit	5%
Total number of taxi journeys in the two segments combined	Unchanged after de-restriction

Source: Europe Economics calculation

F.74 Chart A6.5 below presents the sensitivity of the estimated realised welfare impacts of de-restriction to the changes in various assumptions, using Scenario 1 and 3 as our central assumptions. The changes are listed by their impacts on the estimated net welfare impact.

Chart A6.5: Sensitivity to assumptions



Source: Europe Economics

F.75 It can be seen that different assumptions affect estimated annual realised consumer benefit and driver cost differently. For instance, if the discount rate applied to licence premium is decreased by 20 per cent, then the estimated annual driver cost increase would be decreased by slightly less than £10 million (for example a less than £10 million increase in net annual welfare impact). In general the estimated taxi driver cost increase is more sensitive to the assumptions made, and adopting Scenario 4 would lead to the most significant decrease in net annual welfare impact, as the annual driver cost increase would increase by more than £30 million.

Conclusion

F.76 There are several main conclusions from our estimations of the welfare impacts of de-restrictions.

F.77 First, de-restrictions in the 48 LAs that have de-restricted since 2003 have led to realised annual consumer benefits ranging from about £2 million to £5 million, depending on assumptions.

- F.78 Second, the same de-restrictions have led to driver cost increase, and the magnitude of the realised annual driver cost increase ranges from about £12 million to £30 million, also depending on assumptions.
- F.79 This is consistent with the findings of OXERA literature review (2003). As a specific example, it cited Toner and Mackie (1992), which considered the impact of de-restriction. It found that, in the scenario where entry control was abolished but fares control was maintained at the existing level, this led to an increase in consumer surplus, as taxi numbers increase substantially, but a reduction in overall welfare, as the same increase in taxi numbers led to cost increases.⁶³
- F.80 However, we have not been able to quantify all the major impacts of de-restriction due to limited data availability. Other welfare impacts which should be taken into account include the welfare gain or loss of existing consumers and drivers in the pre-booking segment and that of new taxi drivers or new passengers, including those previously using unlicensed cabs.
- F.81 Therefore we cannot make a firm conclusion on either the magnitude or the sign of the realised net welfare impacts of de-restriction in the 48 LAs which have de-restricted since 2003. Moreover, we would also like to emphasise that, due to the limited number of samples (4 de-restricted LAs and 7 restricted LAs), our estimations would best be treated as the best possible estimation given limited data availability, and a wide range of outcomes deviating from our estimations in either direction are also plausible.

G GLOSSARY

- G.1 Cross border hiring: The act of booking a taxi outside of its licensed area of operation.
- G.2 Disability Discrimination Act 1995 (DDA95): Government legislation. Regulations under section 32 in Part V of the DDA95 can set out

⁶³ Page 19, OXERA (2003) 'Taxi markets literature review', Annexe G of the 2003 study.

specifications for a taxi vehicle to ensure the vehicle is accessible for disabled people.

- G.3 Fare regulation: Regulations that give licensing authorities the power to regulate the fares that licensed taxis charge (but not private hire vehicles). This is done by setting a tariff mandatory (fixed) or maximum fare, or a tariff of maximum and minimum fares.
- G.4 Hailing: The act by a passenger of flagging down a taxi in the street (private hire vehicles cannot be hailed).
- G.5 Illegal taxi: A totally unlicensed vehicle being used to ply for hire.
- G.6 Latent demand: For the purposes of this report we define latent demand as the situation where consumers in areas with quantity controls are discouraged from using taxis by long waiting times and so do even bother to queue for a taxi. This type of demand is hidden because it does not present itself in the form of long queues but it is nonetheless an important source of unmet demand.
- G.7 Licence shortage premium value: The value that can be obtained when selling a licensed taxi in an area where the licensing authority restricts the quantities of licensed taxis. This value is over and above both the administrative fees charged by licensing authorities that issue and renew the licence and the value of an unlicensed vehicle. The licence shortage premium reflects the value of the licence in areas where quantity restrictions apply.
- G.8 Licensing authority (LA): A local authority insofar as it is empowered to issue and regulate licences.
- G.9 Mandatory fare: A fare tariff set by LAs for taxis which should always be applied.
- G.10 Maximum fare: A ceiling fare tariff set by LAs for taxis which represents the maximum that can be charged but allows the taxi driver to charge less.

- G.11 Metropolitan Conditions of Fitness (MCF): Taxis safety and quality requirements devised by the Public Carriage Office for London.
- G.12 Operator: A person who is licensed to operate a private hire business by taking bookings for private hire vehicles.
- G.13 Phone booked sector/ pre-booked sector: A market sector in which vehicles are pre-booked over the phone. This sector includes both private hire vehicles and taxis.
- G.14 Plying for hire: The action of searching for a passenger on the street or at a taxi rank.
- G.15 Private hire vehicle (PHV): A vehicle which is licensed to carry up to eight passengers who have pre-booked but which is not licensed to ply for hire.
- G.16 Quality regulation: Regulation by LAs of the quality and safety of PHV and taxi owners, drivers, vehicles and in the case of PHVs, operators.
- G.17 Quantity regulation: Regulation by LAs of the number of taxi (but not PHV) vehicle licences in issue within their licensing areas.
- G.18 Single tier licensing: A licensing system in which all vehicles are licensed both to ply for hire and to carry passengers who have pre-booked. In a single tier system there is no distinction between taxis and PHVs.
- G.19 Taxi: A licensed vehicle which can ply for hire and take pre booked fares.
- G.20 Taxi proprietor: A taxi owner.
- G.21 Taximeter: An appliance attached to the tachometer in a taxi or PHV vehicle that is used to calculate the total fare for a journey based upon a fare tariff set by reference to time and/or distance.
- G.22 Two tier licensing: A licensing system in which some vehicles and drivers are licensed only to carry pre-booked passengers and some which are licensed to carry pre-booked passenger and to ply for hire. In the UK this results in two forms of licensed hire vehicle: a taxi and a PHV.

- G.23 Unmet demand survey: A survey which measures patent unmet demand by observing how long passengers wait for taxis. Often the survey will make some attempt to also capture latent demand through consumer surveys but these are unable to establish the true extent of latent demand.
- G.24 Wheelchair accessible vehicle: A vehicle which is designed to be accessible to those needing a wheelchair.
- G.25 Zoning: Where a licensing authority licenses taxis to operate only in a limited are, or zone within the total licensing area. A taxi licensed for one zone cannot lawfully ply for hire outside of that zone.