

# TRANSPORT NOTES

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### *Regulation of Taxi Markets in Developing Countries: Issues and Options*

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*Taxis perform an important function in urban transport markets in both developed and developing countries. Because of the perceived vulnerability of passengers to exploitation by operators, entry to the market and fares have been tightly regulated in many industrialized countries. This has typically produced high premium values for licenses, implying some monopoly profit for operators at the expense of users. Curiously, however, total deregulation has often increased fares. This note considers the reasons for increased fares despite deregulation, the regulatory options available, and the relevant considerations in applying this experience to developing countries.*

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#### THE NATURE OF THE TAXI MARKET

The traditional taxi is a vehicle offering point-to-point transport on demand for individuals and small parties. Formally and informally, a taxi market exists in most industrialized and developing countries. In many developing country cities, the single-passenger taxi market overlaps with the shared taxi market on a number of fixed and flexible routes (for example, in the Middle East and North Africa). Shared taxis can bring down unit costs through high occupancy.

The conventional (non-shared) taxi market operates in three distinct ways:

- through direct telephone requests to a taxi company
- from specified fixed taxi stands
- by cruising to find passengers.

Single-passenger taxis are prevalent in low-demand markets, such as those in less-populated rural areas, and for journeys from dispersed residences into activity centers. In denser urban areas, the latter two, referred to as "cruising" or "plying for hire," co-exist with the taxi market that responds to direct-telephone requests.

In some countries, all modes of operation are subject to the same regulation in a single-tier system. In others, dual or multi-tier systems operate. The most common regulatory distinction is that made between cruising, which is subject to stringent controls, and direct-telephone taxi requests, which are regulated more liberally. In the U.K. and many European countries, there is a consequential distinction between taxis which operate in both markets and private hire vehicles (PHVs) which can only operate in the former. In some developing countries, multiple tiers relate to the operational regime, as in La Paz, Bolivia (see annex one).

Demand for taxi services is heterogeneous. In most cities, there is a strong business trip market during daylight hours. This business trip market is based on the

comfort, convenience and relative speed of the taxi, as well as the demand from lower income groups for emergency and essential trips for which no public transport alternatives exist. There is also often a strong leisure market, typically peaking in the late evening and after midnight, when there is an absence of public transportation alternatives. Long waiting times in regulated regimes tend to be concentrated in this market.

#### ORGANIZATION OF THE TAXI MARKET

Taxi services are provided by companies and individual owner-operators. In many countries, including most industrialized countries, the market is dominated by owner-operators who act independently when cruising. In only a few large cities are taxi services supplied by large companies. More generally, vehicle ownership and operation are fragmented, though dispatching groups and radio circuits are more unified and operate at a larger scale. It is also common, particularly in developing countries, for a company or an individual to own a vehicle or fleet of vehicles and charge drivers a fixed monthly "rent." This rental fee may cause drivers to work long hours.

In the direct-telephone taxi market, however, companies and owner-operators are often affiliated with a centralized dispatching service. This enables operators to utilize their vehicles more intensively and gives customers increased certainty in obtaining a taxi within a short period of time by making a single call. In some "single-tier" countries, such as Canada and New Zealand, it is obligatory for operators to belong to a dispatching system, which offers twenty-four hour service to customers. For company operations, separate regulatory requirements may apply to operators and drivers.

Taxi services are normally self-financing, though Sweden subsidizes taxis in rural markets, presumably as a cheaper option than running subsidized public buses during low-demand hours.

## THE SHARED TAXI MARKET

The shared taxi, exemplified by both the "trufi" and the normal taxi in La Paz, Bolivia, but found in different forms in many developing country cities, falls between the traditional taxi and the public transport markets. The shared taxi sector, sometimes legal and sometimes illegal, typically offers services that are quicker and more direct than normal bus service, though usually at a premium price. This sector often overlaps with, and can be indistinguishable from, small minibus services. Shared taxi services tend to develop and expand in times of economic recession and high unemployment, exemplified by the proliferation of "remises" in Buenos Aires after the economic crisis.

Public transport operators tend to view the shared taxi and minibus sectors as undesirable competition since they attract patrons who would otherwise use traditional bus services. Yet the very fact that they can attract passengers demonstrates that they are providing a differentiated service that some passengers value more highly than traditional public transport services. For that reason, it would be advisable to consider carefully the benefits and costs of all transport options, in the context of a broader public transport regulatory strategy, before resorting to an outright ban on the shared taxi sector.

## ADMINISTRATION OF TAXI REGULATION

In non-federal countries, taxi regulation is usually the subject of national laws administered at the local, county and municipality levels. Political control often rests with a committee of a local council, with enforcement through normal policing arrangements. Vehicle examination, often requiring standards distinct from those of ordinary passenger cars, is also undertaken locally.

Local administration often permits regulation that responds to local needs. However, for transport issues, it is important that geographic areas under regulation be sufficiently large to ensure there are enough patrons for the number of taxis and competitors do not cross over from neighboring jurisdictions and operate without regulation. Restrictions on picking up passengers in areas outside a taxi's licensing zone create difficulties for drivers and patrons. However, the absence of restrictions in operating out of an area of registration encourages operators to register where conditions are most liberal. This undermines the effective regulation of service quality. It is therefore desirable that regulatory areas be fairly large and self-contained to minimize cross-boundary activities. In metropolitan areas, it is thus important that regulation be administered at the metropolitan level. In federal countries, such as the U.S., taxi regulation may be a state prerogative, with the effect that very different regulatory regimes co-exist within the same country (Teal and Berglund, 1987).

## THE ECONOMIC THEORY OF TAXI MARKETS

Given the large number of customers and suppliers, the taxi market appears, *prima facie*, to be a classical case of a perfectly competitive market requiring no economic regulation. In practice, however, it has been argued that there is an important element of market failure present in

the cruising market, namely, asymmetry of information. This has the effect of reducing the effectiveness of price competition and bringing into play a process through which the quantity of supply and fares exceed what might be considered socially optimum.

The argument is as follows: In a cruising cab market, customers typically do not know how frequently a taxi will pass. Moreover, if fares are unregulated and can vary between taxis, patrons will not know whether to accept or reject the first and subsequent fares offered. Hence, most patrons will take the first taxi that stops, regardless of price. Under these circumstances, taxi drivers might not benefit from offering lower fares in hopes of increasing patronage. There will be no downward pressure on prices through the taxi hiring process. Moreover, new entrants into the market reduce the number of fares a taxi can obtain (assuming that demand is relatively inelastic to the level of supply). As a consequence, taxi drivers may in turn increase fares to protect total earnings since this will not significantly affect the level of patronage. If, however, fares rise to a level that makes the taxi business seem profitable, more entrants will be attracted. As a result, occupancy rates will reduce further, fares will rise further, and the cycle continues.

Fortunately, there are limits to this cycle, especially in areas where several types of taxi services exist. As fares for cruising taxis rise, patrons may begin telephoning taxi companies and comparing rates. Shared taxi services are also likely to attract patrons unwilling or unable to pay the higher single-passenger prices of cruising taxis. Moreover, in cities such as Lima and Bangkok where the number of taxis is high, the frequency of taxi arrivals makes it possible for customers to bargain. Under these circumstances, required regulation may relate more to congestion and the disturbances associated with competition for passengers than the charging of high fares.

In principle, where taxis are required to operate from designated ranks or stands, it should be easier, in theory, for passengers to respond to fare differentials. In practice, however, "first in, first out" conventions at taxi stands undermines the competitive process, making taxi stand systems and prices similar to those of the cruising taxi market.

The direct-telephone taxi market is potentially free from the information failure problem. Passengers can shop around to compare fares. This can be facilitated if there is an obligation to publish a fare schedule (boarding charges plus rate per mile and/or per minute) and quote rates for standard trips, for example, as in Sweden. The disadvantages of this system are the time and costs incurred in shopping around, especially if there are many small operators. Therefore, the direct-telephone taxi market tends to be dominated by medium to large companies and dispatch associations. The main risk in this market is that there will not be enough companies in the market for competition to be effective.

As a result of the differences in the way each taxi market functions, many countries adopt a liberal approach to regulating fares and entry in the direct-telephone taxi market and a stricter approach with respect to cruising.

**REGULATION OF THE TAXI MARKET**

Governments in industrialized countries often have enacted taxi market regulations when concerned about the vulnerability of passengers to fraud and mistreatment by unscrupulous taxi drivers and companies. Concerns about taxi domination of heavy traffic flows that lead to urban congestion are also a major issue, especially now in many large Chinese cities. Schreiber (1975) argues that regulation is necessary to secure stability of supply by ensuring that "serious" long-term providers of taxi services stay in business. Protecting long-term providers from temporary market entrants during recessions when other employment opportunities are limited provides stability in taxi service provision. As a result of such arguments, markets have been tightly regulated.

Regulation of taxi markets typically relate to the following:

- ❑ quantity of supply: specified in terms of the number of operators or number of vehicles
- ❑ quality of supply: including the quality of the vehicle, the financial capability of the operator, the competence and trustworthiness of the driver, and sometimes the efficiency of the dispatching arrangements
- ❑ fares: either in terms of fixed or maximum tariff schedules.

*Quantity regulation* is applied in many jurisdictions in the form of limiting the number of licenses available at any time. In the U.K., limitations originated when traffic congestion was perceived to be the result of a proliferation of taxi licenses. In industrialized countries, taxis rarely dominate traffic flows, though this is not the case in developing countries. For example, eighty percent of the vehicles circulating in central La Paz, Bolivia are public transport vehicles, mostly some form of taxi. Larger Chinese cities are especially vulnerable to congestion caused by public transport vehicles.

In industrialized countries, arguments for quantity regulation now tend to focus on limiting quantity to maintain quality and achieve sufficiently high utilization rates to keep down fares per carriage.

*Quality regulation* is important because passengers cannot easily ascertain the safety and security of taxi services offered. Quality regulation typically covers the vehicle, the driver and (less commonly) the actual vehicle owner. For vehicles, regulations frequently cover passenger space, minimum engine power, age limits, emissions and safety tests (usually more frequent than those for private cars), vehicle identification, and metering. For drivers, regulations often require a criminal background check, a rigorous medical examination, a minimum age and/or level of driving experience, and adequate geographical knowledge of the area in which they intend to operate. Proprietors may also be required to have a clean criminal record and carry appropriate comprehensive insurance for their taxi operations.

*Fare regulation* is generally applied to protect passengers from exploitation due to the dispersed nature of transactions, the asymmetry of information in the cruising market, and the administrative difficulties of providing for differential access to crowded taxi stands.

Provision of information to first-time users of a city's taxi system is important to address the asymmetry of information and the frequently-voiced concerns of tourists and other occasional users who get "taken for a ride." Fare regulations can take different forms:

- ❑ obligatory tariffs: to be observed at all times
- ❑ posted tariffs: to be determined by the operator, but once declared and posted in the vehicle, to be the maximum chargeable
- ❑ maximum tariffs: to be declared and shown, but subject to downward negotiation.

Arrangements that allow price variation by day and time of day may be legitimate from both demand and supply sides. For example, in some countries, where fares are negotiated rather than controlled, fares may increase during bad weather. While such opportunistic fare increases may be unacceptable in situations where the customer is in a position of weakness, scheduled variations, such as those for late nights and weekends, might be both acceptable and economic.

While quality regulation is applied in most countries, in industrialized countries, quantity and fare regulation vary widely (table one).

**Table 1. Taxi Regulation in Industrialized Countries**

		FARES	
		Deregulated	Regulated
ENTRY	Deregulated	Sweden New Zealand Few U.S. cities	Ireland Netherlands Some U.S. cities Some U.K. cities
	Regulated	Norway	Canada Some U.S. cities Some U.K. cities

Where all factors – quantity, quality and fares - are regulated simultaneously, as was the case in most industrialized countries for many years, the license to operate (referred to in some countries as a "medallion" and in others as a "plate") became a valuable asset. In some countries, operating licenses became directly and indirectly tradable, often at a premium. The premium represents broadly the capitalized value of the expected future profit flows associated with protection from free market entry. In the U.K., the average license premium in areas subject to quantity regulation is \$30,000, though the amount can reach \$100,000. In Hong Kong and some regulated U.S. markets, the premium value of the license is even higher. Observation of these high artificial premiums has led many industrialized countries to liberalize regulation.

Even in cruising, where the case for economic regulation is strongest, optimal regulations are difficult to identify. There may be a trade-off between waiting times, which can decrease as the taxi supply increases, and fares, which might increase as occupancy rates decline. The effect of increased supply and reduced waiting times tends to benefit peak-period passengers, while fare increases affect all. There may also be a differential effect between business users, who tend to use taxis during the

day, and leisure users, whose demand is concentrated at night. Determining the optimal level of supply requires information about the elasticity of demand with respect to changes in fares and waiting times and involves judgments on the value different individuals place on time. Beesley and Glaister have argued that writing regulations requiring the evaluation of such detailed and fluctuating information requirements would be so demanding that it is better not to intervene at all.

**THE EMPIRICAL EVIDENCE ON DEREGULATION**

Toner and Mackie (1992) have argued that it is possible to make a welfare assessment of taxi regulatory systems by examining changes in waiting times, fares, and service quality in countries that have deregulated. The British Office of Fair Trading (OFT) studied recent deregulation experiences. The findings are summarized in table two.

**Table 2: The Effects of Regulatory Change**

Regulation Post-Reform	Country	EFFECTS OF CHANGE ON		
		Supply	Fares	Quality
All Deregulated	Sweden	Large +	Initial + Then 0	Little Change
	New Zealand	+ 160%	Rural + Urban 0	+
	Some U.S.	Large +	+	Stable
Entry Free Fares Regulated	Ireland	+ 100%	N/A	+
	The Netherlands	+	Initial + Later -	+
	U.K.	Small +	N/A	Small +
	Some U.S.	+	+	Stable
Fares Deregulated Entry Regulated	Norway	0	Initial + Then 0	+ Night
	Some U.S.	0	+	Stable
All Regulated	Canada	0	+	+
	Some U.S.	0	0	N/A

The outcomes reveal the following:

- ❑ In *Sweden*, the direct-telephone taxi market dominates and more than half of all trips are government subsidized, especially in rural areas. The cost of subsidies rose substantially. Curiously, although waiting times decreased, surveys revealed no change in consumer satisfaction.
- ❑ In *New Zealand*, supply increases were concentrated in urban areas and fares were little affected. Whereas in rural areas, supply fell and fares rose.
- ❑ In *Ireland*, where the taxi stand and cruising markets dominate in major cities, the supply increase was particularly large, but the PHV-sector declined.
- ❑ In the *Netherlands*, where changes were phased in, the increase in quality is most noticeable in taxi

- stands on weekends. As in Sweden, a large proportion of rural trips are subsidized.
- ❑ In the *U.K.*, the intent to deregulate entry was frustrated in many cities by a loophole which allowed authorities to continue to restrict entry unless there was evidence of significant unmet demand. Hence, changes have been muted, and the issue is under reconsideration.
- ❑ In *Norway*, the supply has increased, especially for nights and weekends. Differential fare increases were implemented to attract service suppliers at those times.
- ❑ In *Canada*, where the concern was with quality and fares and entry continues to be controlled, increases in mandated quality have resulted in fare increases.
- ❑ In the *U.S.*, where there is local discretion on licensing policy, fares have increased wherever entry or fares have been deregulated.

Despite these national differences, some general conclusions on regulatory systems can be reached. As might be expected, when entry is liberalized, supply increases to a degree that depends on the rigidity with which supply was previously controlled. New small entrants to the industry tend to focus on cruising, while deregulation of the direct-telephone taxi market tends to increase the size of existing firms and associations in the market. In rural areas and thin markets, however, taxi supply tends to increase less than in dense urban markets. If cruising continues to be controlled when entry is deregulated, PHVs will continue to complement taxis in the direct-telephone market, but they may also enter the cruising market on a full-time or part-time (peak hours) basis. The British Office of Fair Trading review thus concluded that quantity controls reduced availability and limited mode of transport, increased waiting times, and had adverse impacts upon safety since illegal and unregulated operators picked up excess demand at peak times (the late night leisure market in the U.K.). This suggests that *deregulation from quantity control will usually increase the welfare of taxi users.*

The main argument against that conclusion arises where heavy congestion is caused by taxis. Under those circumstances, the reduced waiting times associated with increased supply might be offset by slower speeds and increased journey times. Even in these circumstances, however, it is important to attempt an empirical assessment of the balance between the countervailing effects, rather than simply assuming that any contribution to congestion from taxis is an automatic warrant for quantity regulation. The combination of empirical evidence on the relationship between waiting times and taxi volume (examined in the OFT review) and an urban traffic model can be used to make this assessment. This suggests that *where taxis contribute to congestion, a careful study of total journeys and waiting times should be undertaken to determine to what extent, if any, quantity control is justified.*

As with the consideration of quantity controls in the traditional taxi market, the main disadvantage of the shared taxi market arises where it attracts an increased number of larger vehicles that significantly increase congestion. That is most likely to be the case for services in central areas of larger cities. Careful analysis may suggest that the external, congestion, costs are sufficiently great to justify some restrictive regulatory

policy. *The appraisal of the case for restraint of the shared taxi market should therefore take a similar form of cost-benefit appraisal to that suggested for quantity controls on the traditional taxi market.*

If the conclusions of such studies are that some quantity control is justified, then it is likely that the immediate effect will be to increase the profitability of taxi operation and generate a premium value for a taxi license. Part of the benefit of the restraint will thus leak as a windfall gain to existing license holders. Another way of viewing this is that fares will tend to be higher than necessary to secure the desired volume of supply. There are two main ways of trying to ensure that benefits accrue to the public rather than to the operators, namely:

- ❑ Attempting to control fares at a level which prevents the emergence of a premium on licenses
- ❑ Auctioning licenses of fixed duration of validity (perhaps three years) so that the excess profit accrues to the municipal coffers.

Neither of these is likely to be easy. The first poses a considerable burden of information collection. The second introduces the need for an administrative procedure which may give scope for corruption (though a rather similar system has been applied successfully to the limitation of certificates of entitlement to purchase private automobiles in Singapore). The conclusion is that *wherever quantity licensing is applied for congestion reasons, it should be accompanied by carefully considered policies on fare regulation or charging for licenses.*

When both entry and fares are deregulated, international experience shows that fares tend to rise. This increase is highest where demand is low (in rural areas) or the competitive process most constrained by market failures (in cruising, and particularly at ranks). In contrast, prices tend to become differentiated by time of day (for example, late night surcharges) and location (with the development of fixed fare systems for high demand locations such as airports). This suggests that *continued regulation of fares is necessary to prevent the adverse effects of total deregulation.*

Some aspects of quality, such as waiting times for service or probability of getting a successful hire with a single telephone call, are a function of supply quantity. For example, when entry to the market was deregulated in Ireland, the average size of companies in the direct-telephone markets increased and the success rate in phone bookings increased. Other aspects of quality, such as driver performance, is independent of quantity control, but tends to fall over time and become difficult to enforce in a deregulated market. In some countries, such as Canada, the main emphasis of taxi policy in recent years has been on quality enhancement. Hence, *either full or partial deregulation needs to be accompanied by the*

*tightening of quality controls and increased enforcement, especially with respect to the quality of vehicles and drivers.*

Wherever entry has been deregulated, the value of an existing license plate falls to a level determined by the administrative charges made for the issue of a new one. The U.K. OFT concluded that, as licenses could not legally be bought and sold, there was no need to attenuate the policy of deregulation on that account. But in situations where licenses could be traded, and even in situations where they had been traded on a large scale in the past, the impact on the welfare of low-income people might be significant. Where the distributional impact was seen to be strongly adverse, this could be attenuated by phasing in the change over a substantial period (perhaps by auctioning defined tranches of licenses each year until no new entrants offered to buy the licenses). *It would be prudent to examine the distributional impacts of immediate quantity deregulation.*

## RECOMMENDATIONS FOR DEVELOPING COUNTRIES

Both the theoretical and empirical considerations suggest some recommendations for developing countries:

- ❑ Taxi regulation needs to be tailored to local problems, objectives and market conditions, with the greatest attention paid to behavior in the cruising market.
- ❑ Quality control regulations should cover vehicles (safety and emissions) and drivers (good character, safe driving skills, good health and geographical knowledge).
- ❑ In the cruising market, neither total regulation (fare and entry) nor total deregulation is likely to be as effective as partial regulation involving fare control accompanied by quality-controlled free-entry.
- ❑ Where quantity control is deemed necessary to reduce congestion, tight price control and/or competitive tendering of annual operating licenses should also be implemented.
- ❑ Strong enforcement capability is necessary to maintain quality.
- ❑ Where liberalization of a previously strict regulation is involved, it may be necessary to undertake the liberalization gradually, paying attention to the effects on the livelihood of poorer individual operators.
- ❑ In cities where taxis contribute significantly to air pollution, tight environmental controls should be considered, taking into account the demonstrated local availability and capability of maintaining cleaner technology and cleaner fuel vehicles.
- ❑ The position of shared taxi services should be assessed in light of a broader public transport regulatory strategy, allowing for the benefits of a differentiated supply, but full taking into account the external congestion costs.

## ANNEX ONE: TAXI REGULATION IN LA PAZ, BOLIVIA

The applicability of the main conclusions of this paper to developing countries can be exemplified by reference to the situation in La Paz, Bolivia (Vasquez Blacud, 2004)

The metropolitan area of La Paz consists of two main municipalities with a combined population of 1.5 million. La Paz city is the industrial, economic and financial center of the country, while the town of El Alto is a largely residential satellite.

The total vehicle stock of the metropolitan area is about 150,000, of which nearly 25,000 are public transport vehicles (including over 9,000 taxis). Most of the buses are small, with 14 to 21 seats. However, public transport, including taxis, serves 93 percent of total daily trips and accounts for 80 percent of the vehicles circulating in the central area of the metropolis.

There are three classes of taxi service, all provided by the same type of four-seat vehicle:

The *radio taxi*, supplied almost entirely through telephone hiring, provides conventional door-to-door individual hiring services and is used mainly by upper and middle income groups for a wide range of journeys. Radio taxis have a low average utilization of 0.6 passengers per vehicle during the day, with higher utilization at night when other means of public transport are scarce.

The *normal taxi* operates to a destination determined by the first passenger, but the vehicle can stop to pick up other passengers going in the same direction. These taxis are used by medium to high income people and lower income passengers traveling to work and with luggage. Taxis have an average occupancy of 1.2 passengers per vehicle.

The *"trufi"* operates on fixed lines, though with 590 such lines, it is often possible to get effective door-to-door service. "Trufis" carry mainly worker from suburbs to town centers. Trufis have an occupancy average of 2.8 passengers per vehicle.

All classes of service have free access, established by a supreme decree of 1987, though there is still a strong union presence through the Chauffeurs Confederation of Bolivia. However, there is strong quality and price control.

A national body, the Superintendence of Transportation, part of the sectoral regulation organization SIRESE, grants vehicle authorizations to operate, establish technical standards, process all complaints, and enforce standards. Radio taxis must not exceed five years of age. The Superintendence also approves the maximum prices and tariffs for all transport modes "trufis" and normal taxis currently have maximum flat fares of 40 U.S. cents per trip, while radio taxis have distance-related reference tariffs of 2 to 15 times higher.

Other authorities have some contingent or concurrent powers. The Municipal Governments of La Paz and El Alto are responsible for traffic management, establishing operational standards, and determining the number and location of routes for fixed route services.

To limit congestion, the Municipality of La Paz restricts vehicle entry to the central area using license plate numbers. Bolivian Police control operation in the streets and enforce vehicle safety regulations and driving behavior. They are responsible for ensuring proper maintenance of vehicles according to the law. The Superintendancy of Telecommunications grants frequency licenses for radio taxis.

Because of a certain degree of concurrency in decree provisions, there are inter-institutional agreements between the Superintendence and the municipalities clarifying the allocation of functions (see Vasquez Blacud for details). There are also institutional agreements with the operators association relating to taxi traffic management and control and the provision of public road infrastructure.

The regulatory regime in operation thus consists of freedom of access to the market associated with fairly tight fare and quality regulation. This results in a well-differentiated set of services meeting different types of demand, with a high level of taxi service availability. The radio taxi in particular is viewed as a safe, reliable and comfortable service, while the *trufi* and normal taxis are viewed as lower in quality, but more economical.

The main problems perceived concern the contribution that taxis make to congestion and environmental degradation in city centers. Despite license plate restrictions (applied to all vehicles) stricter traffic volume control is still being sought.

### TO LEARN MORE

An extensive discussion of taxi market issues and recent international experience in taxi market regulation are contained in the recent report on taxi regulation published by the U.K. Office of Fair Trading, accessible at:

<http://www.offt.gov.uk/Market+studies/Studies/taxis.htm>

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