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Economic Evaluation of Taxi Industry Reform in Sydney

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May 2009

Abstract

This paper reviews the performance and regulation of the taxi industry in Sydney. The taxi industry is a complex set of arrangements between taxi plate holders, taxi radio networks, taxi operators and taxi drivers. However, the paper shows that the industry is a heavily regulated, poorly performing, virtual monopoly. A review of the economics literature finds that there are few efficiency or equity reasons for the kinds of regulation in place in Sydney. Rather, the regulations contribute to the monopoly control and the inefficient performance of the industry. The paper then provides estimates of the benefits and costs of abolishing entry restrictions (subject to safety standards) along with other reforms that would allow increased competition. The paper finds that these reforms would provide net benefits of the order of \$265 million per annum. Over 20 years, this would be a net benefit of the order of \$3.0 billion in present value terms. Given the assumptions required for modelling outcomes, these estimates must be treated cautiously. However, the paper argues that these are plausible (and probably conservative) order of magnitude estimates of the benefits of comprehensive policy reform.

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“The (Productivity) Commission has been unable to identify benefits to the community that justify restrictions on taxi numbers. Accordingly, it considers that there is a strong case for the removal of such restrictions”

Productivity Commission, 1999, *Regulation of the Taxi Industry*, p.ix

“The taxi industry is virtually alone among consumer services in having laws that restrict the actual number of taxis providing services. No compelling argument can be made to justify these restrictions. The need for comprehensive taxi reform is urgent.”

National Competition Council, Autumn 2000, *Improving our Taxis*, p.5.

“There is a clear case for regulating quality standards in the (taxi) industry on consumer safety and protection grounds. ... By contrast, the benefits of restricting entry into the industry are effectively zero, while the costs to consumers are extremely large.”

National Competition Council, November 2000
Reforming the Taxi Industry in Australia, Staff Discussion Paper, p.2.

“In summary, we have concluded that the overall quality of taxi services could be enhanced by reforming elements of the regulatory framework. While some aspects of regulations are entirely sound, other aspects can be **improved**, and in particular quantity regulation should be **removed**.Quantity regulation – limiting the number of taxis – reduces availability and lowers the quality of service to the public. These restrictions should therefore be lifted.” (Bolded words in the original).

Office of Fair Trading (UK), 2003,
The Regulation of Taxi and PHV Services in the UK, (pp.2-3).

“The Round Table examines the basic case for liberalisation of the taxi industry, and reviews experiences of taxi (de-)regulation in OECD and ECMT member countries.... The discussions ...concluded that little empirical evidence supported the argument that entry restrictions supported capacity utilisation. On the contrary, the case could be made that increased entry and associated economics of densities, as well as shorter waiting times, warranted subsidies for entry”.

OECD, 2007, *(De)regulation of the Taxi Industry*, summary statement.

“IPART remains of the view that there would be value in a full review of the (taxi) industry that touches upon its structure, its viability and the impact of the regulations imposed.”

IPART, 2008, *Review of Taxi Fares in NSW*, p.9.

1 Introduction

The taxi industry in Sydney is a heavily regulated virtual monopoly with restricted entry. Actually, it is a monopoly created in large part by regulation. In this paper I describe the nature of the industry and the major outcomes and evaluate the benefits and costs of a comprehensive reform of the regulatory regime.

More specifically, the paper is laid out as follows. Section 2 paper describes the nature of the taxi industry. Section 3 outlines the major entry, service quality, and price regulations governing the industry. Section 4 describes some of the major performance outcomes. In section 5, I discuss efficiency (market failure) and equity arguments for regulations of the taxi industry. Section 6 describes methods for evaluating policy options. Section 7 provides estimates of the benefits and costs of abolishing entry restrictions (subject to safety standards) along with other reforms that would increase competition in the industry. There is a brief concluding section.

2 The Taxi Industry in Sydney

Figure 1 provides a sketch of the taxi industry in Sydney. There are four main sets of participants: licence plate owners, taxi operators, taxi radio networks and taxi drivers.

About 3600 taxi licence holders own some 5100 taxi plates for use in Sydney (IPART, 2008).¹ About 80% of these are perpetual licences issued free on a seniority system by the NSW Government up to 1990, except for auctions of a small number of plates in 1986 and 1989. The 20% of plates issued or sold by the Government since 1990 include “ordinary licences” (10 to 50 years), “short-term licences” (1-6 years), wheelchair accessible taxi (WAT) licences, some 265 “9200” (night-time) licences for shifts from 5.0 p.m. to midnight, and about 100 restricted peak-hour licences. However, the time conditions are apparently administered loosely. Licences can be purchased in the secondary market. The current price for a perpetual licence is about \$380,000.

In Sydney, about 4350 operators run the 5100 taxis.² Taxi operators must have a licence to operate a taxi. According to IPART (2008), 81 per cent of the taxi licences in Sydney are leased. Taxi operators are responsible for the maintenance and insurance of the taxis. They may drive the taxi or bail (lease) it to a driver.

All operators are required by government regulation to be affiliated to a taxi radio network. These networks provide various services, including a radio booking system, a GPS tracking system and alarm monitoring service.

¹ IPART (2008) reports that 4500 licence holders own about 6400 plates in NSW and that there are 5100 plates in Sydney. The estimated licence holders for Sydney are pro-rated. The Taxi Council of NSW knows the identities of the licence holders, but I understand that the identities are not publicly available. The data in this paragraph draws on media sources.

² This draws on NSW estimates in IPART (2008) and Ministerial Inquiry (undated) and pro-rates from NSW figures to Sydney.

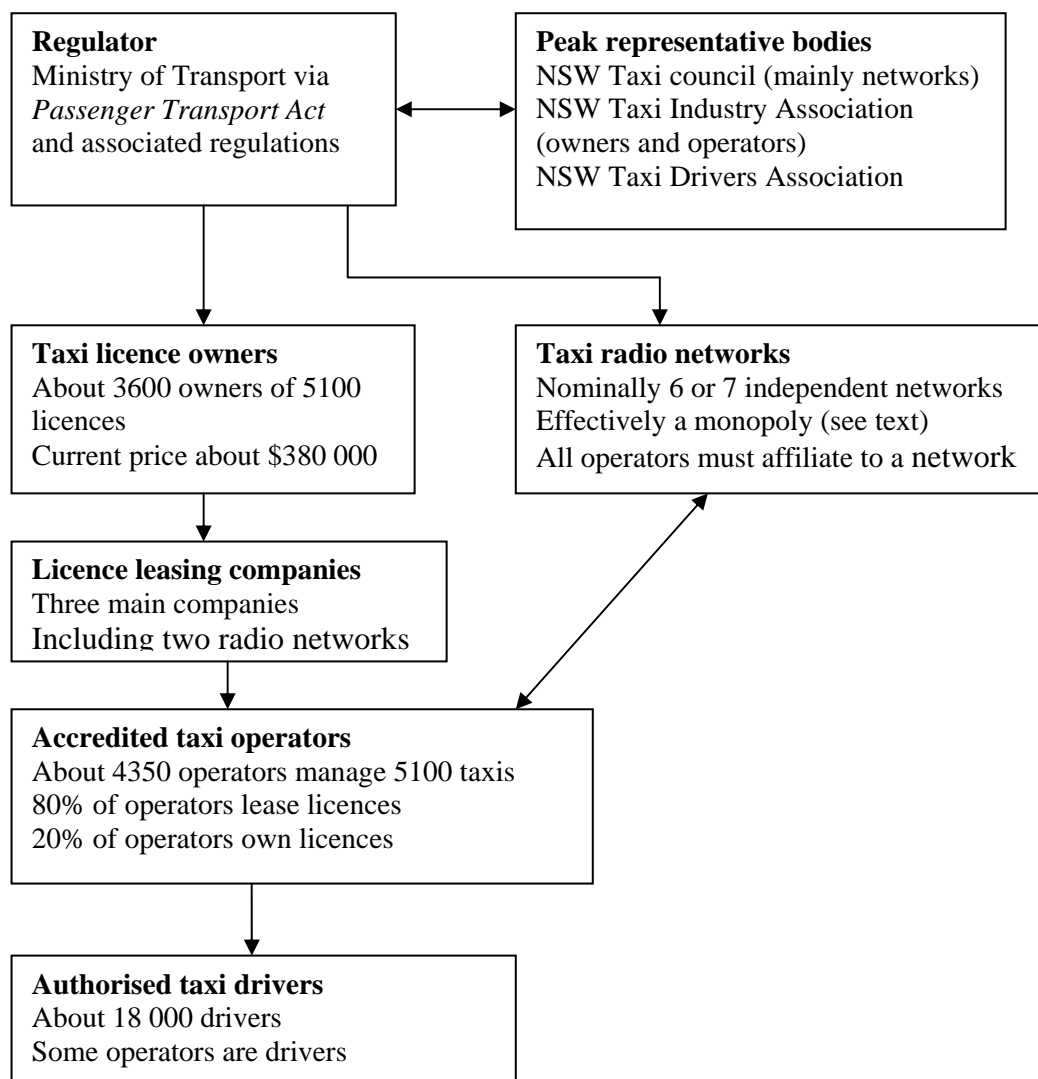


Figure 1 Structure of taxi industry in NSW

The Ministry of Transport website lists 13 taxi radio networks in Sydney. However, because of the relationships between the networks, there are in effect only five semi-independent networks: Combined Communications Network (CCN, owned by the publicly listed company Cabcharge), Premier, Legion, Manly / RSL and Lime. The table in the Annex shows the major relationships between the various nominally separate networks, including the sharing of radio network facilities.

This table also shows the number of taxis controlled by each network.³ CCN (Cabcharge) controls about 3200 taxis (3400 with St. George); Premier 825 taxis; Legion 520 taxis; and Manly/RSL taxis (380 taxis). Thus Cabcharge controls over 60% of the taxis on the Sydney streets.

³ This information comes from various sources within the taxi industry as well as from media sources in turn derived from officials in the Ministry of Transport.

But this is only part of the picture. There are close management and financial relations between Cabcharge, Premier and Legion taxi services.

- The Managing Director of the parent entity (Adelhill Limited) of Premier Cabs Pty. Ltd and a Director of the major taxi subsidiaries in the Premier group has been a director of Cabcharge since 1996. He has a beneficial interest in over a million shares in Cabcharge (valued currently about \$8 million). In 2007-08, he attended all nine directors' meetings of Cabcharge and drew a director's salary of \$96,850 (Cabcharge, *Annual Report, 2007-08*).
- Cumberland Cabs Company Pty. Ltd., a subsidiary of Premier Cabs, also owns over a million shares in Cabcharge.
- Legion Cabs (Trading) Cooperative Society Limited owns 2.75 million shares in Cabcharge with a value of nearly \$20 million at to-day's depressed share price, which is nearly \$40,000 for each taxi operator in its fleet.⁴

Between them, the Cabcharge, Premier and Legion networks control about 90% of the taxi operators (and taxis) in Sydney.

In addition to the various controls exercised by the taxi radio networks over operators and drivers described in more detail below, the networks (and Cabcharge in particular) enjoy three further actual or potential monopoly powers.⁵

- Nearly all taxis in Sydney are fitted with Cabcharge's EFTPOS facility, for which Cabcharge charges 10% of the fare.
- The networks provide the in-house facilities for all taxi fit-outs with communication devices and liveries.⁶
- The networks also point operators towards specific insurance companies. At around \$15,000 per annum, taxi insurance appears expensive.

Moreover, according to a media report, Cabcharge and Premier have virtual control over the leasing of licence plates. Apparently these two companies along with Elizabeth Finance arrange most of leases between the licence holders and the operators. Moreover, reportedly, Elizabeth Finance arranges the 1500 licences that it controls to Taxis Combined Services (Cabcharge).⁷

⁴ These investments reflect the fact that the public company Cabcharge was largely a creation of the major taxi networks.

⁵ Australian Financial Review, 28 September 2006.

⁶ Taxi operators can choose their own communication devices, but they are typically bundled in with other provisions as the networks have a natural monopoly over supply of such services.

⁷ Source: *Australian Financial Review*, 28 September, 2006. The NSW Taxi Council has told the writer that this is unlikely to be the case. It may be noted that taxi operators can change network only with the agreement of the plate licence holder.

Some results of this virtual monopoly on industry structure and performance are described in the next two sections.

Turning to the fourth major industry participant, there are about 18,000 taxi drivers in Sydney authorised by the Ministry of Transport (Ministerial Inquiry undated).⁸ Most taxis in Sydney are leased to drivers for a fee per shift varying from about \$120 to \$200 per shift depending on the time of the week. The average cost in Sydney is about \$160 per shift (or \$960 a week for six shifts). In addition, drivers pay fuel costs.

There are also several representative taxi industry associations. However, the NSW Taxi Council is widely viewed as the “peak industry body” (Ministerial Inquiry, undated). This Council is predominantly an association of the taxi radio networks.⁹ The office of the Council is in the Cabcharge building. From the late 1980s to the late 1990s, the Chairman of Cabcharge was the President of the NSW Taxi Council, Director of the NSW Taxi Association and Chairman of TCS.¹⁰ The Ministry of Transport requires all operators to undertake a two weeks accreditation course run by the NSW Taxi Council.

Services provided by Sydney taxis

Table 1 provides a picture of the taxi services provided in Sydney per shift and per year and the income derived by taxi operators and drivers. It also shows driver expenses and some operator expenses. Some of these data are inputs for the economic evaluation of policy reform below.

Estimated average gross revenue per taxi is in the order of \$237,000 per annum (GST inclusive). Of this, an estimated gross \$94,000 accrues to the operator and \$143,000 to the drivers of a taxi (average 2.7 full time equivalents per taxi). After paying for hire of the taxi, a full time taxi driver working 220 shifts per annum earns an estimated \$55,000 gross per annum. After paying GST and expenses, a full-time taxi driver earns an estimated \$41,000 per annum before income tax.

3 Major Regulations of the Sydney Taxi Industry

The economics literature (e.g. Bekken, 2007) identifies three main forms of regulation on the taxi industry: quantity, quality of service and price regulations. Quantity regulations are often described as entry regulations. This is somewhat misleading in Sydney where entry is deterred by a combination of entry restrictions and industry regulations. In the discussion below, I also describe the regulation of industry structure.

⁸ The report does not have an official author or date. I understand that the prime author was Allan Cook and that the report was written in 2004 and available publicly in 2005. The Interim report can be found on www.transport.nsw.gov.au. No final report was published.

⁹ The NSW Taxi Council currently has 22 members including 8 Directors of the Taxi Industry Association and 2 members from the Country Taxi Operators Association.

¹⁰ Source: *Australian Financial Review*, 28 September, 2006.

Table 1 Snapshot of the taxi industry in Sydney

Taxi average utilisation data	Unit	Outcome
Shifts per week	no.	11.5
Operating weeks p.a.	no.	51
Shifts per annum	no.	587
Paid trips per shift	no.	20
Paid trips per taxi p.a.	no.	11,730
Total industry trips p.a.	No. (m)	59.8
Taxi revenues		
Average fare per trip	\$ ^a	20.2
Av. cost of licence per trip	\$	2.43
Av. revenue per shift	\$	404
Av. revenue per taxi p.a.	\$	236,946
Total industry revenue p.a.	\$m	1,209
Operator income per taxi		
Operator income / shift	\$	160
Operator income p.a.	\$	93,840
Lease of licence plate p.a.	\$	28,500
Payment to network p.a.	\$	7,000
F/T driver income		
Driver shifts p.a.	no.	220.0
Driver income per shift less rent	\$	244
Driver income p.a. ^b	\$	53,680
Driver GST income	\$	4,880
Driver expenses	\$	9,000
Net driver income p.a.	\$	39,800
Driver income per taxi		
No. drivers per taxi	no.	2.7
Gross driver income per taxi ^b	\$	143,106

(a) All dollar figures include GST.

(b) Excludes credit card charges, road tolls and tips.

Sources: IPART (2008); discussions with IPART officers and taxi drivers.

Quantity (entry) regulations

Until recently, the NSW Ministry of Transport determined the quantity and type of licences it would release each year and issued these either by sale or free. For example in the 1990s it issued some 188 Nexus licences free on the basis that half of these would be used to provide a wheelchair access taxi (WAT) service. However, when the recipients of these licences did not use the WAT licences, the networks were gradually allowed to use the other 94 licences without conditions.¹¹ Other licences may restrict the time and/or place where taxis can work

In recent years, the Ministry of Transport has been offering to sell new ordinary and short-term licence plates and it states on its website that there are no restrictions on purchases of plates. The purchase price is available on application to the Transport

¹¹ According to the Ministerial Inquiry (undated), there are 11 types of licences and “an almost infinite number of condition variations”. The Inquiry also estimated that the networks obtained a collective windfall gain of \$29 million from the relaxing of conditions on the Nexus licences.

Operations Division. My understanding is that the price for an ordinary (50 year) licence is set at the average price of perpetual licences in the secondary market over the previous 10 weeks.¹² This is currently about \$380,000.

There is no official information on the number of licence plates released over the last 10 years. Certainly, few licences have been issued in the last 5 years. Drawing on various sources, an estimated 1000 to 1100 licences have been issued since 1990, which is an increase in the taxi stock of 20% to 25% over nearly 20 years, i.e. a growth rate of barely 1% per annum. Not surprisingly the market price of taxi licences has escalated. Drawing on research on brokerage websites, the price of a licence has increased from about \$250,000 in 2004 to \$380,000 today, *a price increase of over 50% in five years.*

Between 1991-92 and 2007-08, real gross state income rose by 81 per cent, which was equivalent to 3.8 per cent per annum.¹³ In the absence as far as I can determine of any evidence on the income elasticity of demand for taxi services, it can plausibly be assumed that the income elasticity would be at least one and that demand for taxi services would therefore have risen by at least 81% from 1990 to 2008. However, over the same period the number of taxi plates increased by only a little over 20%. This is despite IPART's recommendation in 1999 that the number of taxi licences in the Sydney metropolitan area should be increased by 5% per annum in part to make up for excess demand as well as for natural growth in demand.¹⁴ Moreover, there was already excess demand for taxi licences in 1990. In the 1989 auction taxi licences, the licences sold for between \$150,000 and \$200,000.¹⁵ Although the ultimate service unit is a taxi service and taxis can be utilised with varying intensity, there is little doubt, as the request for fare premiums and the evidence on service given below attests, that there is significant excess demand for taxi services in many periods in Sydney.

Why have so few new licence plates been issued at the market price over the last few years? There appear to be two reasons. First, the licences appear to be offered at the high end of the price range for the relevant licence and lower priced licences can be bought on the secondary market. The second reason is that a licence is no use without an agreement with an operator who in turn must have a contract with a taxi network. We have seen that most agreements between licence holders and operators are organised by the two dominant networks. In these circumstances, a prudent investor in a taxi licence has a strong incentive to purchase a licence in the secondary market with an ongoing set of rental and contract agreements.

Regulation of industry structure

In the regulatory structure in place in NSW, the government has out-sourced management of the industry and responsibility for it to the taxi radio networks. The networks are both a major industry player and the industry monitor.

¹² Source: NSW Taxi Industry. Given that there are few licences of exactly 50 years are sold in the secondary market, this is presumably the average price of perpetual licences.

¹³ ABS Cat. No. 5220.0, *Australian National Accounts: State Accounts*, Table 1.

¹⁴ IPART, 1999, *Review of the Taxi Cab and Hire Car Industries: Final Report*.

¹⁵ Source: Treasury officer who worked in Ministry of Transport in 1989.

As outlined by the Ministry of Transport (2008), this document:

“forms part of the regulatory framework within which network providers are to provide clean safe and reliable taxi services to the travelling public. This document recognises that the provision of these services is achieved through a complex set of regulatory mechanisms that reflects the structure of the NSW Taxi Industry and provides clarity on the taxi-cab network provider’s accountabilities, include (*sic*) how these accountabilities are to be appropriately cascaded down through to taxi cab operators and drivers. In this regard, *the taxi-cab network provider is considered to be the principle entity for taxi-cab services.*” (Author’s italics).

Accordingly, taxi operators are required

- to be affiliated with a taxi network for the provision of booking services,
- to fit taxis with a network receiver and prescribed communication and safety devices, and
- to ensure that all taxis are fitted with the decals of the network and painted in the colours of the network.

Taxi drivers are required

- at all times when driving a taxi to wear the approved uniform of the network to which the taxi is connected,
- to use the taxi’s receiver in accordance with network procedures,
- to observe the published rules and by-laws of the networks to which the taxi is connected,
- to comply with all reasonable requests of the network to which the taxi is connected with respect to passenger services.

Taxi drivers are prohibited from touting or soliciting for work (though these terms do not appear to be defined in the regulations) and prohibited from using unauthorised trunk radio devices to coordinate work with, or to pass work on to, other taxi drivers. All work has to be arranged via the network.¹⁶

The networks are responsible for service standards in the industry. To obtain a taxi network authorisation, an applicant must satisfy the Director-General of Transport that “the applicant has the ability and willingness to discipline any user of the network who fails to meet the standards or comply with the rules”. (www.transport.nsw.gov.au).

The key standards the networks are expected to meet relate to booked services. The networks are expected:

- To meet at least 97% of all requests over a period of a month, and
- To pick up at least
 - 85% of intending passengers with a waiting time of no more than 15 minutes

¹⁶ NSW *Passenger Transport Regulation 2007*, clause 147.

- 98% of intending passengers with a waiting time of no more than 30 minutes
- 99% of intending passengers with a waiting time of no more than 60 minutes.

As will be seen, the networks fall well short of meeting these standards, even with off-loading of booked services between networks.

To implement these various regulations, the networks require the operators to sign a 60-70 page confidential agreement.¹⁷ In effect, the regulations give the networks control over all operators and drivers using their network. One of many implications is that the networks favour operators who pay higher network connection fees.¹⁸

Service regulations

There are numerous detailed regulations applying to each segment of the taxi market (licence holders, operators, networks and taxi drivers).¹⁹ Consider just two micro-managing examples. An operator must show the Ministry of Transport where and who will carry out any maintenance of his or her taxi vehicle. A taxi driver “must not move more than 3 metres from a taxi without reasonable cause”. The following are more substantive regulations all of which have significant impacts on the operations of the taxi industry.

- All taxis must be large enough to carry the taxi driver and at least four other adults and meet other internal space configurations and they must be less than 6 years old. The vehicle size requirement is a major restriction on the type of vehicle that may be used and significantly increases unit costs.
- A taxi driver must accept a hiring immediately when offered whatever the destination within the Sydney metropolitan area. Taxi drivers are not allowed to specialise in particular services. This contravenes the fundamental economic concept of specialisation of services. As a taxi driver observed to the writer: “Taxi drivers have very limited capacity to plan and optimise their schedule”.
- Taxis are not allowed to stand anywhere except in an official taxi zone. They are not allowed to stand in car parks or anywhere else. Rather, they must always drive around expending fuel and adding to congestion. This adds to costs and reduces competition.
- Except in very limited circumstance taxis are not allowed to display a destination sign. This restricts the opportunity for multiple hiring.

¹⁷ Source: taxi driver discussions.

¹⁸ The CCN network gives preference for booked calls to Silver Service taxis. They pay a higher annual connection fee and in return get preferential treatment in offers for services.

¹⁹ These are detailed in the *Passenger Transport (Taxi-cab) Services Regulation 2001* and the *Passenger Transport Regulation 2007*.

Price regulations

The NSW price regulator (the Independent Pricing and Regulatory Tribunal, IPART) recommends maximum taxi fares (and fare structures) to the Director-General of Transport who almost always adopts them. In turn, the industry invariably adopts these maximum fares as actual fares.²⁰ IPART bases its recommendations on the estimated costs borne by operators (inclusive of payments for licences and network charges) and taxi drivers. In both cases, the costs include an imputed opportunity cost wage for time involved. These recommended maximum fares are designed to ensure a full return on capital and labour for all participants in the taxi industry.

Table 2 shows IPART fare recommendations from 1 July 2008. The basic fare includes a flag fall fare and distance and time charges. In addition, there are night-time surcharges and booking fees. Road tolls and credit care charges are added to the fares.

Two other features should be noted. IPART does not distinguish between peak and off-peak periods although there is considerable excess demand for taxis in peak hours and excess supply in off-peak hours. However, at the request of the NSW Taxi Council, IPART (2008) recommended that taxis should be able to charge a higher fee for premium services up to a maximum of \$11 on certain conditions. These conditions include that the taxi must be booked through a network and that the networks must also offer a standard service at the regulated standard booking fee at the same time. It is not clear how premium services would be defined or how such a scheme would work.²¹

Drawing on IPART's estimated costs, the NSW Office of Industrial Relations issues a contract determination setting the maximum pay-in rates per shift for drivers. In 2008-09, the maximum pay-in was \$151.83 for each day shift but varied from \$164.73 to \$231.25 for night shifts (GST inclusive) plus a fee of \$0.63 per km for excess kilometres. These rates appear to be generally above market rates and so not applicable. However, one thing may be observed. When IPART recommends an increase in maximum fares, the fares rise immediately and so do the pay-in rates. It may also be noted, as a taxi operator observed to the writer, "there is no regulation of network fees".

Table 2 IPART fare recommendations from 1 July 2008

Flag fall (\$)	3.10
Distance charge (\$/km)	1.85
Night-time surcharge ^a (\$/km)	0.37
Waiting time (\$/minute) ^b	0.80
Booking fee (\$)	2.0
Maxi cab surcharge	50% of fare

(a) Journeys starting between 10 p.m. and 6.0 a.m.

(b) The waiting time charge applies in lieu of distance charges at speeds below 26 kph.

²⁰ All taxi meters are set to the maximum fare which is referred to as the authorised fare. Taxi drivers can charge less than this authorised fare if they wish to.

²¹ The NSW Taxi Council considers that the market would define a premium service.

4 Performance of the Taxi Industry

To discuss performance standards, I draw on three main sources. The first is the Ministerial Inquiry into the industry (Cook, 2005). As shown in Box 1, the Inquiry was very critical of the effects of network controls over taxi operators and drivers and their consequence for consumers. The prime objective of the networks is to extract income and, if possible, economic rents out of the operators.²² Only one fifth of taxi services in Sydney are network booked services. The networks do not provide the customer taxi services and they have only indirect concern for, the quality of the consumer service. In the words of a taxi operator interviewed by the writer:

“There is a cancer at the heart of the taxi industry. The control of the networks has eroded responsibility and reward for providing a quality taxi service”

Box 1 Selected quotations from the Ministerial Inquiry (Cook, 2005)

Customer services

- “Over a very long time the regulatory framework has become distorted. It has protected the interests of established industry players while becoming punitive and ineffective in managing customer service.”
- “Drivers and operators are obliged to pay high radio connection fees for a service that many do not fully utilise.”
- “While restrictions on livery and uniforms are actively pursued, real customer service issues are largely ignored.”
- “Drivers are increasingly disenfranchised and leaving the industry at an alarming rate, thus compromising the ability to deliver services.”²³

Regulations over booking services

- “Legislative provisions regarding the private booking services (usually referred to as trunk networks) should be revised urgently.”
- “These services (trunk networks) have operated for more than 10 years with the complete knowledge of both the industry and the Regulator. Demand for them continues to grow – a demand that is driven entirely by customers who do not feel they are receiving a reliable quality service from the existing network booking services.”
- “These services are illegal ... Despite this they continue to flourish not only because of consumer demand but also because the current regulatory provisions do not appear to be enforceable.”
- “At the most basic level, a regulation that centres on the use of radios in a world where third generation mobile phones are being superseded is already redundant.”

²² The networks earn about \$35 million a year in network fees plus fees from vehicle conversions and maintenance and from brokerage on leases and insurances. If the Cabcharge 10% fee for credit payments applies to half the Sydney taxi services, this would generate another \$60 million a year for Cabcharge.

²³ This assertion is disputed by the NSW Taxi Council. The Council says that 80% of drivers stay in the industry for more than 3 years.

The second main source is the IPART (2008) report on key performance indicators supplied by the Ministry of Transport. These numbers are generated by the networks and relate only to taxi booking services. Table 3 provides the number of bookings requested and the number of passengers actually picked up. This shows that 30% of all requests are not met.²⁴ An unknown number of unmet requests are due to customer no-shows. However, fulfilled requests are far below expected regulatory standards.

Table 4 shows waiting times for phone bookings. This includes pre-booked times and peak and off-peak services. For picked-up passengers, the waiting times are broadly within Ministry of Transport standards. The average waiting time for these services is 8.8 minutes. However, these data are meaningless if over 20% of requests are not met.

It may also be observed that IPART (*ibid.*) describes bookings requested as “bookings required”. In fact, bookings requested are **not** equivalent to bookings required. As noted below, many people do not book taxis at peak hours because they do not expect them to be readily available. This casts further doubt on claims of timeliness by the industry.

Table 3 Bookings and pick-ups shown in 2007-08 (excluding WATs)

Measure	No.	%
Number of bookings requested ('000)	13,350	
Number of jobs accepted by taxi drivers	10,700	80.1
Total pick-ups	9,357	70.1

Source: IPART, 2008.

Table 4 Pick-up times as % of total pickups made and bookings requested

	<15 minutes	15-30 minutes	30-60 minutes	>60 minutes	Other
All pick-ups	91.4%	7.6%	1.0%	0.0%	n/a
Bookings requested	64.1%	5.3%	0.7%	0.0%	29.8%

Source: IPART, 2008.

The third source on performance is the survey of 1347 taxi users across Australia by Colmar Bruton (2002). This survey included 200 taxi users in inner Sydney and 102 users in outer Sydney. The following are the main results of the survey for Sydney.

- Of all the Australian cities, Sydney recorded the lowest scores for taxi trip satisfaction.
- Sydney also recorded the lowest scores for taxi driver behaviour and standards.
- 38% of respondents in inner Sydney and 22% of respondents in outer Sydney had tried to get a taxi in the last six months and failed.

²⁴ According to the NSW Taxi Council, the number of requests is overstated because it includes double counting for off-loaded bookings.

- In inner Sydney, 5% of respondents had made a complaint to a taxi-related agency but 26% had felt like complaining and did not do so. The comparable figures for outer Sydney were 4% and 12%.²⁵

Evidently, network-generated records of timeliness and complaints are incomplete records of industry performance because many potential users do not book taxis and many potential complainants do not waste their time making a complaint.

5 Policy Objectives and Market Regulation

Before developing a de-regulatory policy package, we need some discussion of efficiency and equity objectives and of potential market failures. A market is efficient when producers supply the services that people want at least cost. It is inefficient when people are willing to pay for a service but it is not provided.

It is well established that competitive industries are efficient (Abelson, 2008). There is no case for regulating a competitive market for reasons of inefficiency. On the contrary, regulating a potentially competitive market, for example by restricting entry, creates inefficiencies and social costs. If economic agents want to engage in trade, both sides benefit. Restricting the number of people who can trade restricts these benefits. Inefficient regulation is known as “government failure”.

Taxi services would appear to meet most of the requirements of a competitive market. They provide excludable private goods. In the absence of regulation, there would be few barriers to entry and exit to the industry and most parts of the market would be competitive.

Note that the taxi market may be viewed as three markets (cruising, rank and booked markets) which have some distinct features. There are also markets for networks (or communications), operators and drivers.

However, the literature identifies several potential market failures in taxi markets. They include the monopolistic character of some elements of the taxi industry, external effects and information failures. Also, it is sometimes argued that parts of the taxi market do not have a stable equilibrium and that this creates inefficiencies.

Imperfect competition arises when there are significant fixed costs and low marginal costs, so that average costs fall with size of operation. This phenomenon could apply to some extent with radio networks. A study would be needed to determine the extent of this. However, the findings may depend on the service requirements imposed on networks, for example the area to be covered, and the ability of the networks to develop

²⁵ The NSW Taxi Council believes that these results are not credible and that the survey must have been based on a biased sample.

alliances. The concentration of market power in very few (and colluding) networks in Sydney appears to owe as much to regulation as to economics.²⁶

Falling average cost also applies to taxi-cab operations. Most taxi costs per (fixed-hour) shift are fixed, including driver time. Accordingly, the marginal cost per trip is below average cost. However, the key point is that for a given amount of taxi work, an increase in taxis results in lower utilisation and more idle time for taxi drivers. If trips per shift fall, average cost rises (as shown in Figure 2). This is the “excess entry” result derived from Chamberlin’s (1933) model of monopolistic competition. It follows that, in some circumstances, entry restriction may minimise unit costs (Heyes and Heyes, 2007).

However, there are three offsetting factors. First, as de Vany (1975) observed, excess capacity provides an offsetting welfare benefit by reducing passenger waiting time. Second, if imposts like taxi licence fees are abolished and fares fall, the demand for taxis will increase at no cost to taxi drivers. Third, taxi drivers with spare time in off-peak hours may obtain income from alternative work such as community transport or courier work or even work outside transport.

Turning to externalities, taxi services like most motor vehicles have environmental impacts on air quality, noise, greenhouse gas emissions and road congestion. However, these impacts can generally be managed best by control over types of vehicle and fuel use and by road user charges rather than by restricting taxi numbers and services.

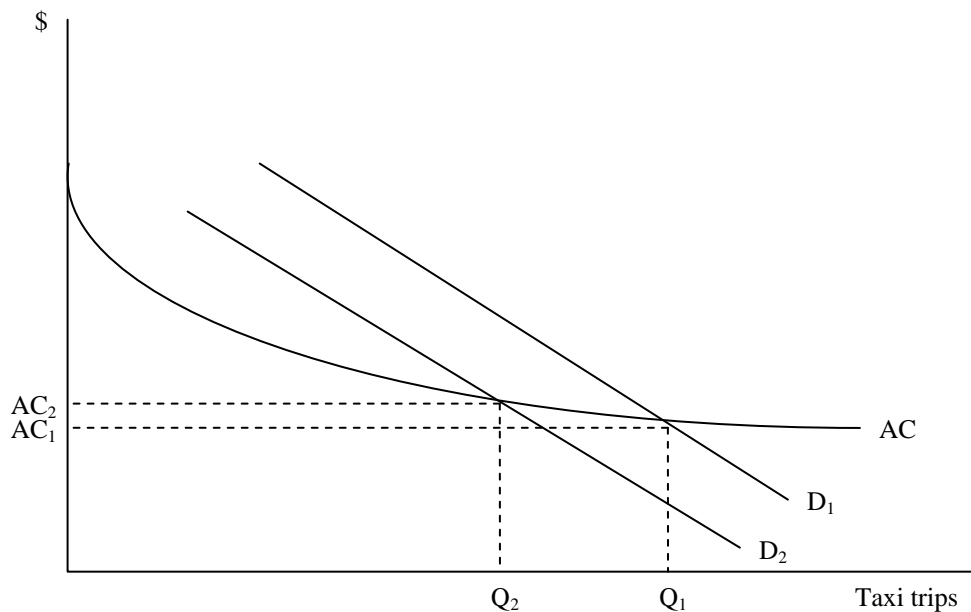


Figure 2 Rising average costs with declines in taxi utilisation

²⁶ TCS was reportedly able to take over ABC cabs because ABC Cabs had too few licences to service its market area north of the Harbour and TCS was able to exploit this market more profitably.

Lack of information, or more precisely asymmetric information, is another potential market failure. Taxi users may not know the quality of their vehicle or driver, although in a competitive market operators would have an incentive to create a reputation of service. There may therefore be a case for regulating safe standards of driver and vehicle security. However, safety issues are generally tackled most efficiently by testing vehicles and by training and testing drivers rather than by suppressing trade.

In relation to price information, the main problems arise in the hailing rather than in the rank or booking services (OXERA, 2003). In the latter markets, comparative prices are easier to obtain.²⁷ In the hailing market, taxis have a spatial monopoly and there can be significant search costs. Then, monopoly pricing can occur even when there are a large number of prospective (deregulated) suppliers (Diamond, 1971). Another predicted consequence of uninformed consumers in a deregulated hailing market is deterioration in the quality of services.

However, these conclusions that consumers would be poorly informed about the quality of the brand that they are buying. The analysis also predates the potential for provision of price information on the internet. It is increasingly possible for anybody to access comparative price information at any time on the internet, even in the cruising (hailing) market. Price information deficits can be dealt with by requiring that taxis fares and other relevant service information is made publicly available on a common website as well as in taxis.

The fourth efficiency issue is a function of the inter-relationship between demand and supply. Demand is a function of expected waiting time (and therefore of supply) as well as of fares. Supply is a function of expected utilisation (and therefore of demand) as well as of trip revenues and costs. Some theorists (Cairns and Liston 1996; Heyes and Heyes, 2007) point out that this can produce more than one equilibrium (output) solution in the market and that one equilibrium may be preferred on welfare grounds to another. In principle, this could justify some regulation. However, the practical implications are less clear. It would be asking a lot of an industry regulator to adjust industry settings because of a minor failure to achieve a welfare- maximising equilibrium.

In summary, economic principles strongly suggest that competition would improve services in the taxi industry rather than the reverse. Information failures justify regulating vehicles and drivers for safety issues. Other market failures provide little justification for substantive regulation of the industry.

Notwithstanding these arguments, several analysts have found that deregulation of taxi markets has had some adverse consequences (for example, Teal and Berglund, 1987; Dempsey, 1996; Toner, 1996). Bekken (2007) produces a balanced and more up-to-date summary for European countries. Bekken finds that removal of entry restrictions significantly reduces waiting times. However, it does not necessarily reduce fares because they were often over-suppressed under a regulated regime. Also, unit costs

²⁷ However this may cause problems in congested areas like airports.

sometimes rise because of lower utilisation in low demand areas. Almost always, there are more fare and service variations. However, where fares remain regulated, as theory would predict, there tends to be increased servicing of profitable areas and less servicing of less profitable areas. There has been a significant fall in vehicle or driver standards in some places, but this reflects principally inappropriate relaxation of regulations rather than unrestricted entry.

Evidently there are some important policy issues. A move towards free entry may not be welfare enhancing if combined with poorly regulated fares or with a failure to regulate taxi and driver standards.

Equity objectives

There are many possible equity objectives, including protecting consumers generally or specific consumers who need wheelchair access and protecting one or more of the supplier groups in the industry (or perhaps all of them!). Thus, price regulation may protect consumers, albeit at a potential cost of loss of competition and services for some consumers. Restrictions on the entry may protect existing owners of capital or workers, but discriminate against new entrants.

An interpretation of the regulations in Sydney is that government views taxis as a form of public transport and is regulating the industry with the objective of providing services to all households across the city with only short waiting times. In order to achieve this objective, the government gives the networks powers to direct operators and drivers to take any jobs that arise along with performance requirements.

In practice, industry regulation is often poorly targeted and an inefficient form of welfare support (Abelson, 2008). Taxi price regulation in Sydney means poor services in peak periods and in areas and for trips that taxi drivers don't want to service and find means of avoiding. Entry regulation benefits taxi plate holders but no other part of the industry. Regulation over industry structure empowers the networks but does not provide universal, or anything close to universal, public transport across the city and stifles innovation and productive efficiency.

Reform Options

Given the web of regulations covering entry, industry structure, services and fares in Sydney, there are numerous deregulatory policy options and a long report indeed would be needed to evaluate them. In this paper I focus on free entry into the industry. Operators and drivers would be required to pass basic safety standard checks, but there would be no other barriers to entry. There would be no leasing fee for a taxi licence other than for basic taxi and driver checks and to fund an independent regulator.

In a deregulatory environment, it would also be expected that taxi operators could operate any kind of vehicles subject to safety standards and consumer demand and choose to run taxis independently of radio networks or at least with arrangements with a range of communication agencies. Drivers could make private arrangements with

consumers and each other. Prices would be set competitively and vary by time and place subject perhaps to their publication on a common website.

Both theory and evidence suggests that entry deregulation would produce much higher benefits if it were accompanied by complementary deregulatory policies. The extra competition would likely generate an array of new services and prices and cost savings that are difficult to forecast and model. The benefits of free entry would be reduced if other regulations are retained, especially regulations that allow the networks to control taxi services. In the evaluation below, it is assumed that any major regulatory impediment to free entry and competition would be lifted. However, these complementary deregulatory policies are not formally defined or assessed.

It should also be noted that the evaluation below provides estimates of the net annual benefit of free entry into the taxi industry in Sydney at the present level of demand. The paper does not attempt to project demand and supply or net benefits forward over time.

6 Evaluating the Costs and Benefits of Taxi Deregulation

The evaluation principles are developed in the four related figures below. Using a standard supply and demand diagram, Figure 3 shows two perfectly elastic supply schedules at unit cost. With the initial supply (S_1), the fare (F_1) is the average cost (AC) of a taxi trip plus the licence fee (LF), which is a form of tax. The demand for taxi trips is given by schedule D_1 and there are Q_1 taxi trips per period. With no entry fee into the industry, the fare falls to F_2 . In addition, the demand curve shifts right to D_2 as the quality of service rises (waiting times fall). The fall in fares for existing consumers is a transfer from taxi suppliers to users. However, existing users also gain surpluses equal to area A. New users gain consumer surpluses equal to areas B + C + D.

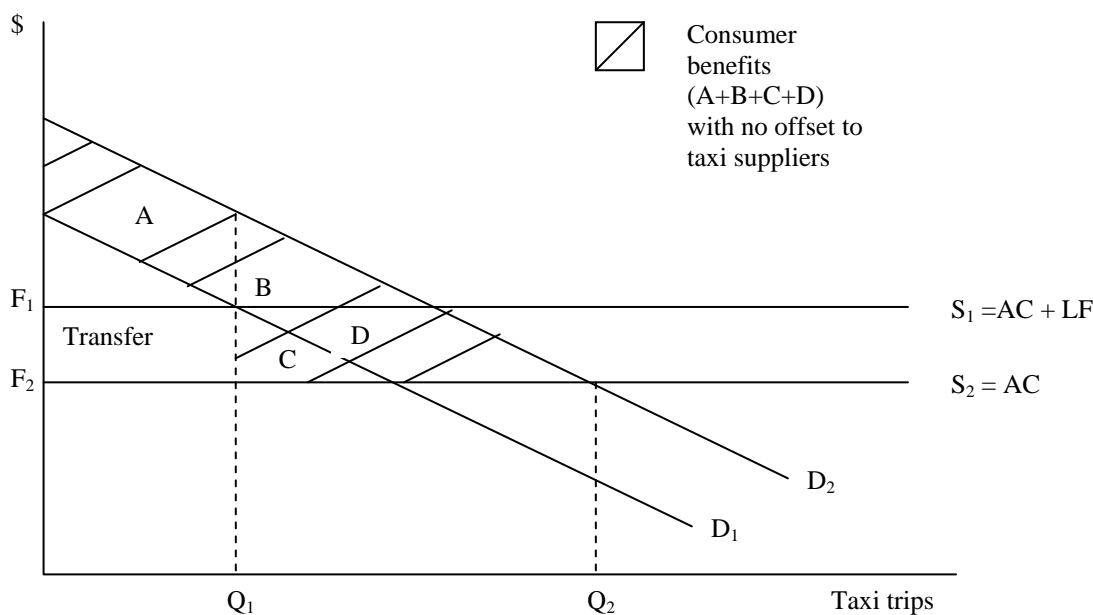


Figure 3 Consumer benefits from increase in taxi services

Figure 4 provides an equivalent exposition drawing on the concept of generalised cost (GC) that is often employed in transport economics. This facilitates quantitative estimates. The cost of a taxi trip is now GC. This is the sum of the fare and the cost of waiting time for a taxi. In this figure:

$GC_1 = AC + NW$, where NW is normal waiting time (i.e. average waiting time with no entry restrictions).

$GC_2 = AC + NW + LF$.

$GC_3 = AC + NT + LF + EW$, where EW is excess waiting time.

In this case, there is only one demand curve because demand is a function of GC. As noted above, if free entry were accompanied by deregulation of other aspects of the taxi industry, taxi drivers may find ways to increase productivity and reduce unit costs, but this is not included here.

In Figure 4, Q_R is the number of taxi trips with restricted entry and Q_U the trips with unrestricted entry. With unrestricted entry, there is no excess waiting time or licence fee and generalised cost falls from GC_3 to GC_1 .

The gross benefits of deregulation to existing taxi consumers equal areas (A + D). The benefits to new users are areas (B + C). Thus gross user benefit = A + B + C + D. However, the fall in taxi fares associated with area D is a loss to taxi owners. Thus the net social benefit equals areas (A + B + C).

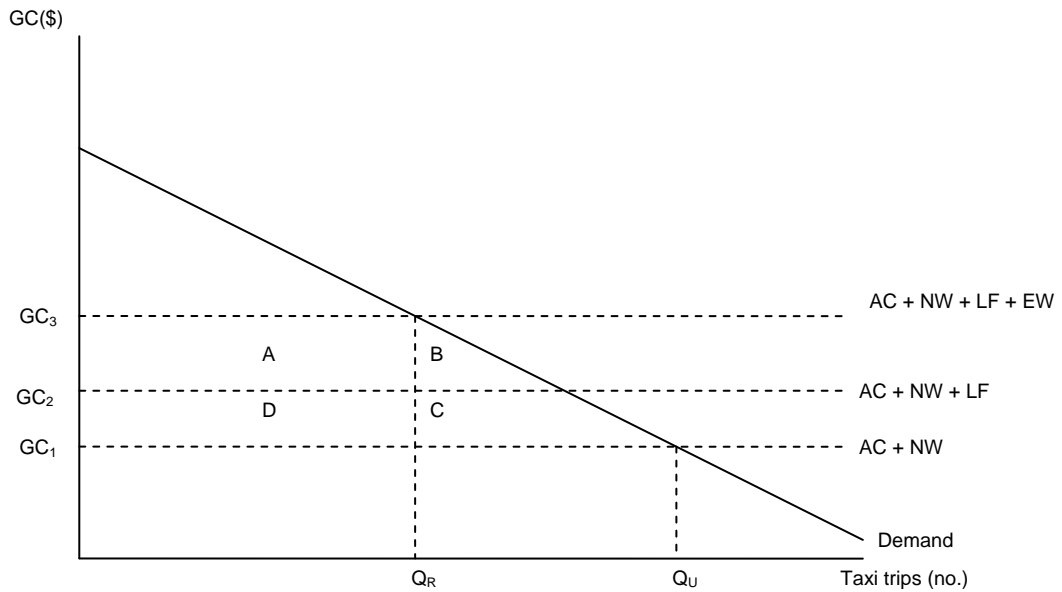


Figure 4 Basic economic benefits: alternative exposition

We now consider some complications. Figure 5 introduces two complications. First, the observed number of trips (Q_R) at GC_3 does not represent the true demand for taxis at this price. Many people do not use taxis in peak hours because of the likely waiting time or indeed the possibility that no taxi will be available within the required time. That GC_3 is not an equilibrium price is evidenced by NSW Taxi Council submissions to IPART requesting a premium of \$11 or more on the fare for “premium” services. Real demand exceeds observed usage. This is reflected in the D_2 demand curve in Figure 5. Given this demand and a deregulated generalised cost of GC_1 , usage would now rise to Q_U^* .

Second, the average (private) cost does not represent the social cost of a taxi trip for two reasons. The private cost includes indirect taxes (excise taxes and GST) and road tolls, which are transfer payments and not resource costs. On the other hand, taxi trips have some negative externalities (congestion and air quality effects especially). Given that the estimated indirect taxes exceed the negative externalities (see below), the long-run marginal social cost (LRMSC) + NW line is drawn below the AC + NW line. It is assumed that fares must overall cover long-run marginal costs.

In Figure 5, the benefits of deregulation to existing taxi users still equal areas (A + D). Discounting the loss to taxi suppliers, the net social benefit remains area A. However, the benefits of generated trips are now much greater. The benefits to users equal areas (B + C + E + F + G). The other net benefits to society equal areas (H + J). This is the excess of government revenue and road tolls over the environmental costs of taxi trips.

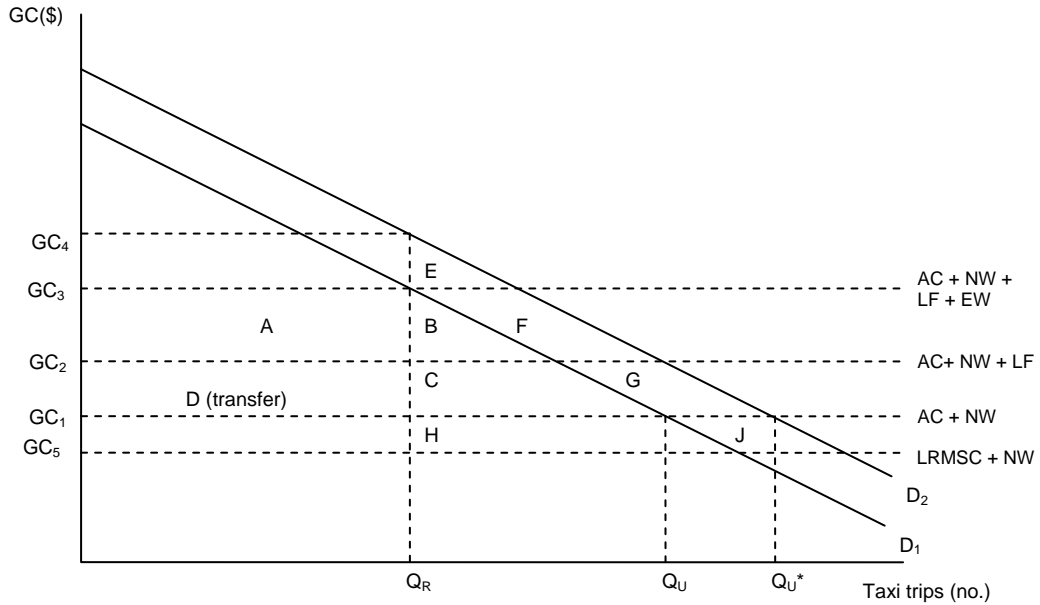


Figure 5 Adding evaluation complications

Finally, we introduce the fundamental feature of transport, namely that demand is much higher in peak than in off-peak hours. With unregulated pricing, peak fares would likely exceed average unit cost shown in peak hours so as to equate supply with peak demand. In off-peak hours, fares would be closer to marginal operating cost.

Figure 6 depicts an off-peak scenario. Demand is lower and it is assumed that there is no excess waiting time. It is also assumed that fares will fall as the private marginal cost (PMC) of operating in off-peak hours does not include fixed vehicle costs. Thus GC_6 is lower than GC_1 and taxi use (Q_U) is determined by the intersection of the demand curve with GC_6 . Again, marginal social cost (MSC) is lower than PMC.

In this off-peak model, existing taxi consumers gain benefits equal to areas (A + D). However, in this case both areas A and D are offset by losses to taxi drivers (who make higher returns in the peak periods). On the other hand, benefits to new consumers equal areas (B + C). Net social benefits equal area E.

In the evaluation that follows, I distinguish between peak and off-peak effects. Peak hour effects are evaluated based on Figure 5 but assume that the fare will remain at $AC + LF$. Off-peak hour effects are based on Figure 6.

Based on discussions with taxi drivers, peak hours constitute about a third of operating hours per week (40 of the working 120 hours) and taxis do twice as many paid trips in a peak hour as in an off-peak hour. This implies that peak hours account for half of all existing trips in Sydney (30 million per annum) and off-peak hours account for the other half (also 30 million trips per annum). The detailed working assumptions are shown in Table 5.

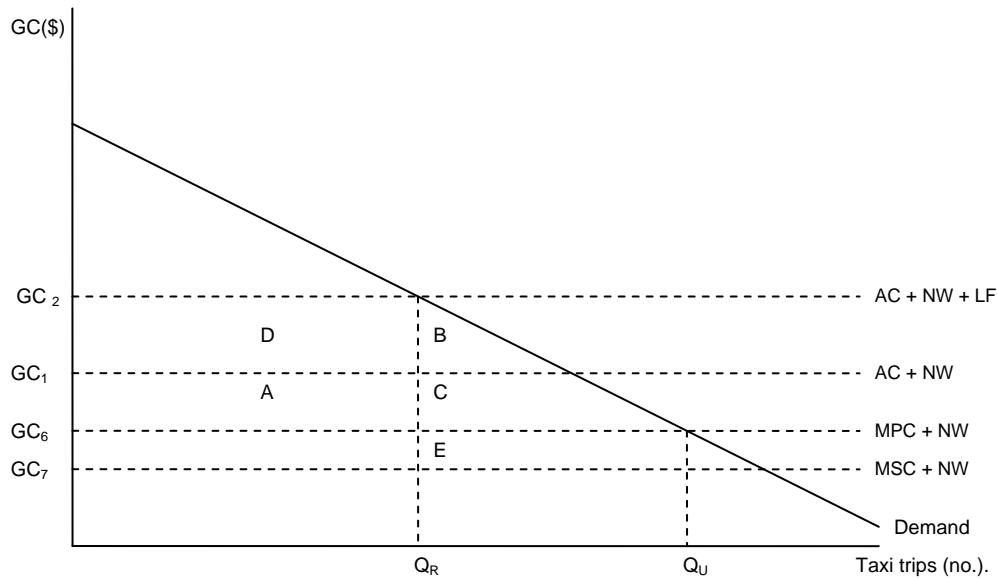


Figure 6 An off-peak model

7 Estimated Net Benefits of Taxi Deregulation in Sydney

For the evaluation of taxi deregulation, estimates are needed of taxi trip costs, fares and waiting time in peak and off-peak periods, a peak period equilibrium fare, social costs and benefits, and the elasticity of demand with respect to generalised costs. The detailed data and estimates are shown in Table 5. Here I comment briefly on the basis for these estimates.

IPART (2008) estimated that the average cost of a taxi trip in 2008 was \$20.20 and the cost of the licence fee per trip was \$2.43. However, in an unregulated market, peak-hour fares would likely be above average cost and off-peak fares below average cost. In the absence of data that would enable modelling of these prices, for the purpose of this evaluation I assume that taxi drivers would continue to charge LF (\$2.43 per trip) in peak hours even though it would no longer be a cost. On the other hand, I assume that off-peak fares will fall by the same amount below average cost. Given equal peak and off-peak trips, this ensures revenue neutrality for taxis.

We also need estimates of the waiting time (minutes) per trip and the cost of waiting time per minute for 1.8 passengers per trip. The average waiting time for phone-booked taxis in 2008 is 8.3 minutes (IPART, 2008). This includes taxis booked immediately and those booked in advance and it includes peak and off-peak hours.

For this evaluation, a “normal wait time” with a deregulated taxi fleet is assumed to average 5 minutes. This is 3.3 minutes below the average time. Given an equal number of peak and off-peak trips, the average excess wait time in peak hours is therefore 6.6 minutes per taxi (making an average wait of 11.6 minutes in peak hours).

Waiting time is usually related to income. The average weekly income in Australia is \$1145 (ABS, 6302.0). This equals \$30.5 an hour for a 37.5 hour week.

In-vehicle leisure time is usually valued at 33% of hourly wage, but waiting time is valued at up to twice this amount. This suggests that waiting time for taxis would be valued at \$20 per hour per passenger.

However, working time is usually valued at the wage rate. For business users of taxis this may be above the national average wage rate, so we allow \$40 an hour. Allowing for 2/3 leisure and 1/3 business users, the weighted average could be $(0.67 \times \$20) + (0.33 \times \$40) = \$27$ per hour.

Allowing for 1.8 passengers per taxi, this would be \$48.6 per hour or \$0.81 per minute. Thus the average cost of 5 minutes waiting is \$4.0 per taxi. The cost of 11.6 minutes waiting is \$9.3 per taxi.

Estimating the market clearing price with current regulations (GC4 in Figure 5) is also problematic. IPART (2008, Table D.7) reports that there were 13.3 million bookings requested in NSW but only 10.7 million jobs accepted. However this does not include people who would book a taxi if there was a high likelihood that one would be available. The taxi industry has argued for a premium fare of at least \$11, which may be viewed as a market clearing price in peak hours. For this exercise, the average market clearing price premium in peak hours is assumed to be \$5.50.

To estimate the third party effects, the GST component (\$1.84) of the average fare is taken out of AC. However, environmental and congestion costs are included.²⁸ Allowing \$0.10 per vehicle km for these costs @ 7 km per trip, these costs are \$0.70 per taxi trip.

To estimate generated taxi trips I allow a price elasticity of demand with respect to generalised cost of -1.0. This is based on Toner and Mackie (1992) and the review by OXERA (2003). This is an average elasticity. Arguably the elasticity could vary for fares and for waiting time and for peak and off-peak hours.

Summary of results

Table 6 shows the estimated benefits and costs of deregulation of the taxi industry in Sydney. On plausible assumptions about waiting times and other costs of current services, the gains from free entry and increased competition in the taxi industry are in the order of \$265 million per annum. Over 20 years, this produces a net benefit with a present value of about \$2.8 billion (assuming a real discount rate of 7% per annum).

²⁸ Arguably, the GST component of the fare should not be included as a benefit to government because government may lose GST on expenditure foregone to make a taxi trip. On the other hand, any excise tax and road tolls associated with generated trips should be included as a benefit to the recipients. These have not been allowed for in these calculations.

Table 5 Base data for the economic evaluation

Quantity of taxi trips in Sydney		
Total taxi trips per annum (m)		59.8
Persons per taxi trip		1.8
Average trips per taxi per annum		11730
No of taxis in Sydney		5100
Total shifts per week		11.5
Paid taxi trips per shift		20
Hours per shift		10.5
Weeks per year		51
Operating hours per week		121
Peak hours Monday to Thursday		24
Peak hours Friday		9
Peak hours Saturday		7
Total peak hours		40
Peak hours as % all business hours		33
Peak hour / off peak hour trip ratio		2
Trips in peak hours as % all trips		50
Existing peak hour trips p.a. (m)		30
Existing off-peak hour trips p.a. (m)		30
Elasticity of demand as f (change in GC)		-1
New peak hour trips p.a. (m)		9
New off-peak hour trips p.a. (m)		6
Total trips p.a. with free entry (m)		75
Total trips p.a. with free entry (% increase)		25
Cost data (a)		
Average fare (\$)	F	20.20
Licence fee per trip (\$)	LF	2.43
Average cost (\$)	$AC = F - LF$	17.77
Value of wait time per taxi (\$/minute)	VWT	0.80
Normal wait time (minutes)	NWT	5.00
Excess wait time (minutes)	EWT	6.60
Equilibrium premium price (\$)	X	5.50
Cost of normal wait time (\$ per taxi trip)	$NW = NWT \times VWT$	4.00
Cost of excess wait time (\$ per taxi trip)	$EW = EWT \times VWT$	5.28
GST (\$ per taxi trip)	Excise excluded	1.84
Externality cost (\$ per taxi trip)	Ecost	0.70
LRMSC	$AC + NW - GST + Ecost$	16.63
Fixed cost as % of total cost		35
Variable costs as % total cost		65
Average generalised costs in peak hours		
		(\$)
GC1	$AC + NW$	21.77
GC2	$AC + NW + LF$	24.20
GC3	$AC + NW + LF + EW$	29.48
GC4	$GC3 + X$	34.98
GC5	$LRMSC + NW$	20.63
Average generalised costs in off-peak hours		
		(\$)
GC1	$AC + NW$	21.77
GC2	$AC + NW + LF$	24.20
GC6	$AC - LF + NW$	19.34
GC7	$AC - LF + NW - GST + Ecost$	17.50

Table 6 Summary of results

Estimated annual benefits in peak hours		(\$m)
Existing users lower waiting time (Area A)	$Q \text{ existing} \times (GC3 - GC2)$	157.2
New user benefits (Areas B+ E+ F)	$Q \text{ new} \times (GC4 - GC2) \times 0.5$	49.5
Taxi supplier gains new users (Areas C + G)	$Q \text{ new} \times (GC2 - GC1)$	22.3
New social benefits (Areas H+J)	$Q \text{ new} \times (GC1 - GC4)$	10.4
Total benefits		239.4
<i>Transfers</i>		
To suppliers: higher peak hour fares	$Q \text{ existing} \times GC2 - GC1$	72.3
Estimated annual benefits in off-peak hours		(\$m)
New user benefits (Areas B + C)	$Q \text{ new} \times (GC2 - GC6) \times 0.5$	14.7
New social benefits (Areas J + K)	$Q \text{ new} \times (GC6 - GC7)$	11.1
Total benefits		25.7
<i>Transfers</i>		
Existing users lower fares (Areas D + A)	$Q \text{ existing} \times (GC2 - GC6)$	146.0
Summary results: all users and suppliers		(\$m)
Gains to taxi users	No offsetting losses	221.3
Gains to taxi suppliers	No offsetting losses	22.3
Social benefits	No offsetting losses	21.5
Total net benefits per annum		265.1
Transfers per annum		(\$m)
Supplier gains from higher peak fares		72.3
Supplier losses from lower off-peak fares		146.0
Net gain to consumers (loss to producers)		73.7
Total annual impacts		(\$m)
Gains to consumers		295.0
Losses to taxi industry		-51.4
Social gains		21.5
Total net benefits		265.1

These benefits are based on free entry into the industry and price flexibility. They almost certainly require some concurrent reduction in the concentration of market power of the networks. As OXERA (2003) reported, total expected benefits of deregulation were not obtained in the United States because the oligopolistic nature of industry was not addressed. On the other hand, if genuine freedom to compete in the taxi industry is encouraged, there would probably be additional services provided and productivity gains that are not factored into the above evaluation.

In terms of the distribution of the gains, consumers are estimated to obtain annual benefits of \$295 million and there are likely to be small gains to government revenue. On the other hand, the taxi industry would lose an estimated \$51 million a year. This is considerable less than the loss of annual taxi licence fees of about \$145 million. The reason for this is that, with deregulated pricing, the taxi industry is assumed not to reduce peak hour fares (and so not to lose the LF component of fares in peak hours).

This is an important finding because a major objection to deregulation is the losses that are assumed to be inflicted on current industry participants and possible compensation demands.

Deregulation of entry into the industry would have two other noteworthy equity effects. It would promote employment. Each taxi licence issued creates 2.5 jobs. This especially assists people (including students and retirees) who want to provide taxi services without having to pay nearly \$600 a week for a licence to provide a service. Secondly, deregulation would assist to low income and elderly people who do not own or cannot drive private vehicles. Taxis play an important role in providing transport to individuals for whom other forms of public transport are not suitable.

8 Concluding Comments

There are numerous restrictions on trading taxi services in Sydney. Moreover, the regulations of the taxi industry have produced a virtual monopoly.

However, there are few market failures in this industry. There are limited efficiency reasons for regulations other than basic safety regulations and perhaps requirements for information.

The current industry and price regulations may have the equity objective of guaranteeing services to all parts of the city within specified regulated times. But this is not being achieved.

On plausible assumptions, the net benefits from free entry and increased competition in the taxi industry are in the order of \$265 million per annum. Over 20 years, this produces a net benefit with a present value of about \$2.8 billion. This does not allow for potential service and productivity gains from reform of the numerous restrictions on taxi services noted in this paper and from increased competition. Moreover, with deregulation of prices, the gains to consumers and to employment would be at relatively little cost to existing interests in the taxi industry.

To reach these conclusions, a large number of estimates were required. Improved data and further modelling of the taxi market would doubtless refine these results and show the sensitivity of the results to the assumptions made. However, I have little doubt that further modelling would produce similar or higher results.

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Annex A: Taxi Cab Services in Sydney

Network taxi services in Sydney & subsidiaries	Common name	Address	Tel. no.	Provider (a)	Subsidiary	Numbers (b)
Combined Communications Network Pty. Ltd. (c) (d)		9-13 O'Riordan St. Alexandria	9020 2000	Yes	Yes (Cabcharge)	3200
Taxis Combined Services Pty. Ltd. (e)	TCS cabs	9-13 O'Riordan St. Alexandria	13 33 00	Yes	Yes	2400
ABC Radio Taxi Cooperative Ltd.	ABC cabs	9-13 O'Riordan St. Alexandria	13 25 22	Yes	Yes	150
ComCabs					Yes	?
Silver Service Taxis Pty. Ltd.	Silver service	9-13 O'Riordan St. Alexandria	13 31 00	Yes	Yes	360
South Western Radio Cabs Pty. Ltd	South Western cabs	5 Secant St., Liverpool	13 27 88	Yes	Yes	120
TCS Maxi Taxi		9-13 O'Riordan St. Alexandria	13 19 24	No	Yes	?
Wheelchair Accessible Taxi service - Zero 200		9-13 O'Riordan St. Alexandria	8332 0200	No	Yes	?
Yellow Cabs of Sydney Pty. Ltd.	Yellow cabs	9-13 O'Riordan St. Alexandria	13 19 24	Yes	Yes	50
Premier Cabs Pty. Ltd.	Premier, Prestige cabs	33 Woodville Road, Granville	13 10 17	Yes		825
Cumberland Cabs	Cumberland cabs	33 Woodville Road, Granville	8868 4200	No	Yes	?
Northern Districts Taxis	Northern Districts	33 Woodville Road, Granville	13 10 17	No	Yes	30
Peninsular Cabs	Peninsular Cabs	33 Woodville Road, Granville	8868 4141	No	Yes	?
Premier Prestige	Prestige	33 Woodville Road, Granville				
Western Districts Cabs	Western Districts Cabs	33 Woodville Road, Granville	13 10 17	No	Yes	60
Legion Cabs (Trading) Cooperative Society	Legion, Legion Maxi cabs	77 Foveaux St., Surry Hills	13 14 51	Yes		520
Legion Maxi Cabs		77 Foveaux St., Surry Hills	13 14 51		Yes	
Manly Warringah Cabs (Trading) Cooperative Society	Manly cabs		13 16 68	Yes		170
RSL Ex-Servicemen's Cabs & Co-op. Members Ltd.	RSL cabs	14 Sarah Street, Mascot	9581 1111	Yes / No (f)		210
Bankstown Taxi Cabs		14 Sarah Street, Mascot	9581 1111		Yes	
Shire Taxi Cabs		14 Sarah Street, Mascot	9581 1111		Yes	
True Blue					Yes	
St. George Cabs Cooperative Ltd.	St. George cabs	1/105A Vanessa St. Kingsgrove, 2208	13 21 66	Yes / No (g)		210
St George Diamond			13 21 88		Yes	
Lime Taxis Combined	Lime, Apple. GPS, VIP	36/1A Coulson, Erskineville	13 54 63	Yes		50
Doulis Logistics Pty. Ltd.	VIP cabs	7/314 Hoxton Park Rd. Prestons	9600 6171	No longer operating network		15
Total						5100

Notes

(a) As noted by Ministry of Transport (2008) *Guide for Authorised Taxi-cab Network Providers*.

(b) Estimated from various sources.

(c) Not listed as a network operator by Ministry of Transport (2008).

(d) Cabcharge owns Combined Communications Network and Taxis Combined Services (TCS).

(e) Most, if not all, names in this column are essentially brand names. They do not own or operate any taxis.

(f) My information is that RSL network is run through Manly Cabs radio network in North Sydney.

(g) St. George network runs through CCN dispatch system.