

Regulating Supply in Taxi Markets

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Abstract: Regulating Supply in Taxi Markets

The paper is concerned with supply of taxis in markets with quantity and price restrictions. The paper models an Index of Potential Supply (IPS) for use in taxi market regulation.

Economic regulation of taxi markets encompasses quantity, quality and prices. Taxi market regulation originally applied to quantity and quality but did not extend to fares. In the nineteenth century price regulation began as a means of consumer protection. From the 1930s price regulation took on the purpose of income protection.

The paper reviews arguments for and against entry and price regulation, and research on licence values. Licence values existed since the introduction of quantity restrictions. Since the introduction of price regulation licence values have increased dramatically. Licence values manifest monopoly rent.

The paper reviews entry and price deregulation in taxi markets. Outcomes did not confirm expectations. Even though increased supply typically results in lower prices, prices often increased rather than declined. This outcome shows the need for further research.

The paper features a spreadsheet showing how price levels and elasticity of demand predicate the number of taxis. An Index of Potential Supply (IPS) equips regulators with a supply side tool for assessing the effects of changes to quantity and fare levels.

Changes in taxi numbers have repercussions on licence values. The paper asks whether reductions in licence values are tantamount to regulatory taking. The paper cites cases from separate jurisdictions showing this view does not stand up in court.

An Appendix narrates the evolution of taxi services in the context of the evolution of transport infrastructure.

1. Introduction

The purpose of economic regulation is to correct market failure and protect consumers from abuse of monopoly power.¹ Market failure typically occurs when ‘natural’ monopolies, with increasing returns to scale over the range of production, crowd out competitors by undercutting prices. Taxis are not obvious candidates for economic regulation. Taxis, unlike natural monopolies, have neither the attributes of network economies nor the substantial sunk costs of utilities. But for regulatory constraints, taxi markets would have the hallmarks of perfect competition. Since taxi markets are not representative of the market failure scenario, why are they regulated?

Regulation of taxi markets has been taken for granted for a long time. In 1876 one of the first significant cases in regulatory legislation, *Munn v Illinois*, featured taxis on a list of sectors where regulation applied since “times immemorial.”² However, *Munn v Illinois* specified the narrow purpose of regulation was to “to fix a maximum of charge to be made for services rendered.” The exclusive mandate of regulation was to protect consumers from overcharging.

Consumer welfare has been the principal stated objective of taxi regulation throughout, but its remit has broadened over time. Taxi regulation traditionally applied to market entry and service quality. Price regulation was added in the nineteenth century, originally as a means of protecting consumers. From the 1930s it has taken the form of protecting income.

Licence Values

Prices for operating licences have been a feature of taxi markets ever since access has been restricted. Licence values make their appearance in economic literature in the 1960s. Turvey (1961) explained how licence values originate: “Where a limitation of licences is effective and licences

¹ Stiglitz defines market failures as situations in which a market economy fails to attain economic efficiency.

² *Munn v Illinois* (1876) refers to the oversight of taxi drivers (‘hackmen’): “It has, in the exercise of these powers, been customary in England from time immemorial, and in this country from its first colonization, to regulate ferries, common carriers, hackmen, bakers, millers, wharfingers, innkeepers, & c., and, in so doing, to fix a maximum of charge to be made for services rendered, accommodations furnished, and articles sold.”

are transferable we would expect licences to acquire a market value equal to the capitalised value of the excess of earnings over opportunity costs.”³

Milton Friedman encouraged economists to investigate taxi licence values. Where entry is restricted and fares are fixed, taxi licences trade on secondary markets. Friedman notes trade representatives oppose deregulation, which would increase competition and diminish returns to drivers. Friedman poses the question: “Who would benefit and would lose from an expansion in the number of licences issued at nominal fee?”⁴

When Milton Friedman raised the question of market failure in the taxi sector, New York medallions were priced at \$17,000. Today they trade for \$300,000. The rising trend in licence values begs the question whether in the intervening period quantity and price regulation has alleviated or exacerbated market failure.

Structure of Paper

Chapter 2 reviews the successive stages of quantity and price regulation. Taxi regulation began as a means of protecting consumers and in the 1930s was transformed into a means of protecting producers. Chapter 3 reviews literature on entry and price regulation in taxi markets. Chapter 4 relates experience with entry and price derestriction, compares outcomes with predictions, and suggests areas for research. Chapter 5 features an Index of Potential Supply (IPS) showing the interdependence of prices, elasticity of demand, and quantity of taxis, and proposes incorporating IPS in the process of entry and price regulation. Changes in taxi numbers have second round effects on licence values. Chapter 6 relates whether reductions in licence values have been treated as tantamount to regulatory takings. An Appendix narrates how the evolution of the taxi sector is embedded in the development of municipal transport infrastructure.

³ Turvey, 1961, p. 91

⁴ Milton Friedman: Appendix B to Price Theory, (Chicago, 1962) sets out seventeen problems. One of them is ‘Licensing Taxicabs’(p. 346).

2. Evolution of Entry and Price Regulation

Taxi regulation in the United Kingdom

Legal powers to determine the number of taxis and fares in most of England are based on the Town Police Clauses Act (TPCA) of 1847.⁵ The Transport Act of 1985 gave power to lift entry barriers. It has become common practice to benchmark the need for increased taxi numbers against the Index of Significant Unmet Demand (ISUD)

Entry and fare regulation has changed considerably since first introduced and its evolution in England is reviewed briefly. Regulation of quantity preceded regulation of price. The purpose of price regulation was transformed into profit protection comparatively late. The rise in licence values since the introduction of economic regulation has been remarkable.

Entry Regulation

Hackney coaches in London first appear in Elizabethan times.⁶ As soon as their numbers were of any consequence, they became subject to regulation. It is widely believed that hackney regulation from the start was a means of protecting market boundaries and creating a framework for competition. The following sections show the overriding regulatory motivation was to charge for use of infrastructure and protect consumers. Operating licences acquired value once restrictions had been imposed.

Hackneys competed with London's Watermen who ferried passengers up and down the Thames.⁷ In 1601 the Thames watermen lobbied for a Bill "to restrain the excessive and superfluous use of coaches." Employment concerns once more were voiced in 1656, as the watermen's trade had been "much lessened and impoverished," and their "families utterly

⁵ Although TPCA is the most widely applied base for taxi regulation in England, there are many exceptions. Different regulations govern the trade in London, Scotland and Northern Ireland. Quantity restrictions apply in 45% of UK Licensing Authorities, covering 52% of all licensed taxis. Fare regulations apply in 95% of Licensing Authorities. London does not define ceilings on taxi numbers and in this respect is not typical for the country. OFT, 2003, Annexe A, gives a full account of variations.

⁶ The following section relies on Pratt, 1912, pp. 58-63 and Jackman, 1966, pp. 113 - 127

⁷ Pratt, p. 58, points out how intermodal competition policy shaped taxi regulation from the start: "Transport on the Thames constituted a vested interest of great concern to the watermen, who had hitherto regarded as their special prerogative the conveyance of Londoners along what was then London's central thoroughfare; and the story of the way in which they met the competition of vehicular traffic in the streets is worth the telling because it illustrates the fact that each successive improvement in locomotion and transport has had to face opposition from the representatives of established but threatened competition."

ruined.” In fact watermen were opposed only to hackneys which duplicated ferries. In 1634 watermen petitioned to restrict hackney traffic on routes parallel to the Thames, but raised no objection to unrestricted hackney numbers on routes heading north or south. Watermen’s complaints in any event may have slowed, but did not halt, the rise of their rivals.

Hackneys at first were required to wait for customers at designated stands, but soon began to ply for hire. The key difference between standing and circulating hackneys was in causing congestion and adding to road maintenance costs. The overriding consideration in hackney regulation was protection of traffic infrastructure. Proclamations required unoccupied hackneys to remain stationary. The fact these proclamations were repeated allows the inference that hackneys ignored them.

A Royal Proclamation in 1635 limited hackney numbers which had become “a great disturbance” and “the streets themselves are so pestered and the pavements so broken up that the common passage is thereby hindered and made dangerous.” Hackneys gave rise to wear and tear of London’s streets and quantity limits were imposed to contain their number. In 1634 a competitor to hackneys appeared on London’s streets, the sedan chair, which helped to reduce traffic congestion without causing wear and tear on streets and pavements. Even though sedans diverted business both from watermen as well as hackneys, they were welcomed as they reduced congestion. Quantity regulation had as its original purpose congestion management.

Hackney quotas were raised successively. London abolished quantity limitation in 1833, shortly after improvements in road engineering had made street surfaces more resilient. Once quantity limitations were lifted, the hackney sector grew vigorously. From an economic point of view, quantity limitations were dispensable.

Year	Number of Coaches
1625	20
1634	50
1652	200
1654	300
1662	400
1694	700
1711	800
1771	1000
1832	1200
1844	2650
1870	7818

Fare Regulation

Hackney drivers were alert to demand fluctuations and opportunities for differential pricing. For example, ahead of the coronation of George III coachmen timed a price rise in expectation of increased demand. The Privy Council rebuked the trade. Hackneys were required to lay out their fares as early as 1634. Fare policies were set in the interest of consumers rather than of producers.

Drivers acquiesced only gradually to price transparency in the taxi sector. The first comprehensive market regulation incorporating provisions for fare structure was the London Hackney Carriage Act in 1831. Only from 1870, almost forty years later, were drivers required to place their prices on display. Even if by then fares were beyond dispute, drivers and their passengers still argued over distances. Price regulation was ineffective until distances as well as prices were beyond dispute.

London drivers resisted price transparency. A patent in 1858 on a distance recording device, a so-called Kilometric Register, was never installed in cabs. The invention of the taximeter in 1891 was a turning point in urban transport. Taximeters were fitted in six London cabs in 1899 but drivers boycotted their use. Customers patronised taximetered cabs in cities where they had a choice. In Berlin, for example, more than half of cabs featured this equipment by 1900. In London the changeover occurred in 1907, when motorized cabs appeared en masse and were fitted with taximeters as standard. Technological progress was instrumental in changing market practice. Customers, not producers, promoted price transparency.⁸

A New Deal for Taxis

The purpose of price regulation throughout the nineteenth century was to protect customers from excessive charging. Adapting fare regulation and entry restriction as a means of protecting drivers' income began in the

⁸ If passengers today hail 'taxis' rather than 'hackneys,' it seems plausible that this change in terminology occurred when customers began to exercise choice between hackneys which featured taximeters and those which did not.

1930s. This transition has been carefully documented for the case of Chicago and serves to exemplify the paradigm change.⁹

Until the 1930s fares in Chicago complied with an 1866 ordinance on rate ceilings. The 1866 ordinance had six objectives: raise revenue through licence fee, prevent extortionate rates, organize the flow of traffic, set standards of appearance, ensure drivers respect the law, and compel financial responsibility. The 1866 ordinance did not, however, concern itself with profitability of incumbents. The advent of the New Deal was harbinger of a new policy.

In 1934 Chicago introduced wholesale entry restrictions together with regulations expressly designed to protect the profitability of incumbents. Its features are reviewed in brief. Chicago's taxi ordinance guarantees Yellow Cab and Checker Cab a market share of 80%. Future allocation of licences must respect this share. The ordinance expressly regulates rate increases. When the expense-to-revenue ratio exceeds a specified ceiling, the trade may apply for rate increases. When the ratio drops below a specified floor, the trade may put in for more licences. Taxi operators are the sole source of information on profitability. Regulators do not seek independent corroboration.

Foreclosure of competition was highly controversial. Simmering tensions over market entry boiled over after World War II when veterans returning from war found they could not set up as taxi drivers. In 1947 the Department of Justice filed an antitrust suit against Yellow Cab's monopolistic practices.¹⁰

The paradigm change in Chicago's taxi regulation stood previous practice on its head. Operators in Chicago have a perpetual franchise in a market where regulators protect profitability. Chicago in the 1930s set the standard for taxi regulation across the United States. New York today has fewer medallions than when the Haas Act was passed in 1937. In London, the taxi trade in 1950 applied for an introduction of quantity restrictions, but its application was rejected.

⁹ The sequence of events is related by Kitch/Isaacson/Kasper, 1971

¹⁰ US v Yellow Cab Company, 1947. The Supreme Court cleared the defendant arguing that taxi markets were local, rather than interstate, and thus outside the remit of the Sherman Act. Kitch, 1971, discusses the case in extenso.

Profitability and Licence Values

By 1683 hackney coachmen were required to wear a badge as proof of licence, and to contribute to the expense of maintaining London's streets. The cost of a twenty one year hackney licence was £50, plus an annual charge of £4. Business must have been thriving, since in 1715 the annual fee was increased to £12. The annual fee for sedans, 10 shillings, was modest by comparison.

The hefty tax burden levied on hackneys attests to the sector's profitability. Contemporaries were alert to the intrinsic commercial value of an operating licence. Sanders Duncombe, who introduced rental sedans, was granted a fourteen-year monopoly.

By Georgian times hackney owners conscious of licence values sought to convert them into property rights. Until then it had been common practise for hackney licences to lapse when a coachman died. King George I. was petitioned to allow hackney licences to become part of a driver's estate and left for the benefit of his survivors, either for their own use or for sale.

Licence values have not been recorded until fairly recently, but it was common knowledge they existed. In 1947 a court case in the United Kingdom affirmed the legality of licence sales.¹¹

Records of Licence Values

The sustained appreciation of licence values brought them to the attention of economists and their prices have been recorded for individual markets. Three examples, Australia, Dublin, and New York are subjoined.

¹¹ R v Weymouth BC ex p. Teletax (Weymouth) Ltd [1947]

Australia

STATE	1991	1992	1993	1994	1995	1997	1998
NSW	199,161	224,418	222,648	218,508	234,925	284,197	260,000
Vic	133,918	145,079	133,589	161,696	187,940	263,897	265,000
Qld	171,690	195,318	195,931	192,287	185,852	258,822	267,000
SA	104,159	125,810	140,268	152,955	148,264	157,323	158,000
WA	165,967	156,866	155,854	158,418	182,719	233,447	210,000
Tas	66,387	64,605	74,587	71,015	75,176	101,499	100,000
ACT	234,643	260,688	317,274	311,374	250,587	243,597	280,000
NT	148,798	168,881	189,251	185,732	229,704	248,672	230,000

* License values have been adjusted for inflation using the December 1998 quarterly index of 121.9. Indexes for years before 1998 have been constructed by taking averages of quarterly indexes. Figures have been rounded to the nearest unit.

Sources: Australian Taxi Industry Association (1999);

Consumer Price Index Australia 1991 to 1998, 6401.0.

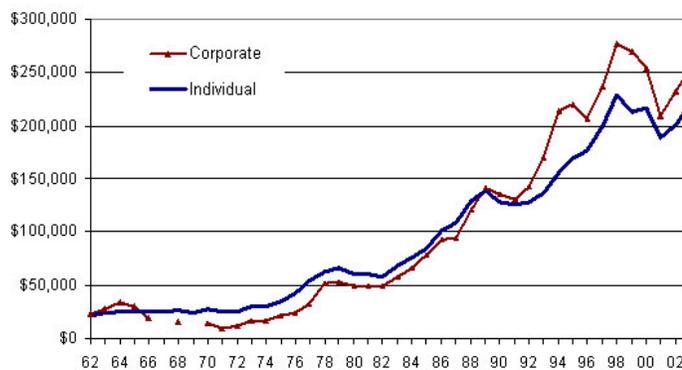
Dublin

Taxi licence prices in Dublin, 1980–2000 (£)¹²

1980 3,500
 1985 7,200
 1990 43,000
 1995 70,000
 2000 90,000

New York

Taxi medallion prices, 1962-2003.¹³



¹² Cit. in Barrett, 2003, p.35

¹³ Schaller Consulting, New York

Summary

The original rationale for capping taxi numbers was to alleviate pressure on road infrastructure. In London quantity restrictions were dropped once municipal infrastructure could cope with increased traffic.

The original rationale for capping taxi prices was to protect customers. Enforcement in any event was difficult until taximeters were introduced. Price regulation as a means of stabilizing earnings did not exist until the 1930s.

Taxis have been regulated since they first appeared, but regulation in its current form is comparatively recent. Only from the twentieth century has quantity and price regulation become a means to regulate competition. The upward trend in licence values occurred subsequent to the combined regulation of entry and prices.

3. Literature Review

The Case for Regulation

Edwin Chadwick (1859) was first to propose economic regulation of taxi markets. Noting the abundance of hackneys on London's streets, he argued that the investment in under-utilised vehicles added to the overall cost of the sector. In hackney markets competition was ruinous.¹⁴ Chadwick recommended awarding a monopoly to a franchisee, who could cut back excess supply and obviate disputes over fares by installing Kilometric Registers.¹⁵ Managing quantity and prices would be left to the franchisee. Chadwick used hackneys as an example of a market where it is better to have competition for, rather than within the field.

Orr (1969), taking his cue from Milton Friedman's suggestion to investigate the components of licence values, argued taxi markets were idiosyncratic in that supply and demand curves measured incommensurable quantities: demand as passenger/miles, supply as driver/hours. An increased number of taxis in the market will depress individual licence values, unless the elasticity of demand with respect to the elasticity of supply exceeds unity.¹⁶ Save for regulation, the market would not find a stable clearing price.

Douglas (1972) argued that in taxi markets customers hailing a cab see only one supplier at a time and cannot compare prices. Taxis, for their part, have little means of competing via product differentiation. In taxi markets "an important element of service quality, waiting time, is not amenable to differentiation."¹⁷ Douglas elaborates why taxi markets without regulation would not clear: "If quality differentiation is constrained, a unique optimum price and quality level in this or similar markets is not defined in the absence of interpersonal summation of

¹⁴ Chadwick, 1859: "The waste of the capital committed by this competition within the field of supply is visible to the eye at all times and all weathers, - in full stands or long files, waiting hour after hour, and in the numbers crawling about the street looking out for fares...It is probably a statement greatly below the fact, that at least one-third of the cabs are, the week through, unemployed; that is to say, one-third of the invested capital is wasted; - a service for two capitals being competed for by three, to the inevitable destruction of one. As in other cases of competition within the field, efforts are made by violent manifestations of discontent at the legal fare, by mendacity and by various modes of extortion, to charge upon the public the expense of the wasted capital." P. 393/4

¹⁵ Chadwick, 1859, pp. 394 - 396

¹⁶ Orr, 1969, p. 147

¹⁷ Douglas, 1972, p. 116

consumers' benefits."¹⁸ Absent a market framework where competitors can differentiate by price or by quality, regulation is indispensable.

Shreiber (1975, 1977) acknowledged the taxi sector is not a typical candidate for regulation. Numerous competitors, low barriers to entry and shallow economies of scale mark the trade. Price regulation is nonetheless necessary, because customers encounter taxis singly and search costs to compare offers are prohibitive. Shreiber posits a taxi market where without price regulation, cab fares would oscillate between a maximum and a minimum. Fares either jump to a level where passengers avoid taxis altogether, or drop so low drivers cannot break even. Within this band demand is inelastic. It is therefore necessary for regulators to fix fares. Shreiber's model takes it for granted that customers find taxis by hailing them on the street. He does not discuss markets where price comparison would be feasible, for example at cab ranks or by telephone booking.

Cairns/Liston-Heyes (1996) concur that unregulated taxi markets are in disequilibrium. They support regulation of prices as well as quantity. Licence values, according to Cairns/Liston-Heyes, reflect profit conditions of the sector.¹⁹ They suggest another rationale for licence values, to the effect that they are tantamount to performance bonds.²⁰

The Case for Deregulation

Licence values are first defined by Turvey (1961) as a 'market value equal to the capitalised value of the excess of earnings over opportunity costs.'²¹ Turvey anticipates arguments why taxi markets lack incentive for price competition. Were fares and profits to increase (decrease), the taxi sector after a lag would see market entry (exit), up to the point when individual drivers' incomes revert to previous levels. Price competition for the individual driver is self-defeating. But what if regulation permitted the sector overall to compete not only by price, but by differentiated product as well? In that case 'the choice lies between low fares and low availability, on the one hand, and high fares and high availability, on the other. A compromise must be reached between

¹⁸ Douglas, 1972, p. 127

¹⁹ "If the regulator optimizes with respect to N , the constraint $\delta > 0$ may not (usually will not) be binding; a positive medallion value may arise. Therefore, positive medallion values are not necessarily evidence of non-optimal regulation." p. 9

²⁰ "Given the efficiency rationale, the medallion also constitutes a bond of the owner to the authority, which hopes to prevent 'shirking' in the delivery of services." P. 9

²¹ Turvey, 1961, p. 91

cheapness and convenience as in some other forms of transport.”²² Quality regulations constrain price competition. For example, if taxi regulation would give leeway on vehicle specification, taxis could be replaced by cheaper models, thus creating potential for fare competition.

Coffmann (1977) objected to Shreiber’s view that in taxi markets price competition was infeasible. He challenged the view whether price regulation improves resource allocation.²³ Lower fare structures could be advertised, either in the media or by colour-coding cabs. Coffmann had two further reservations against assertions that regulation was indispensable. Firstly, taxi market economists were lacking empirical data. Secondly, models should incorporate the impact on taxi markets of mass transit, where subsidies distort inter-modal competition.

Beesley devoted three articles to London’s taxi market over a ten year period (1973, 1979, 1983 with Glaister). Beesley speculated how alternative regulatory regimes might affect taxi markets. Regulation creates costs as well as benefits. Beesley predicts “higher prices and lower input, the more stringent the regulation.”²⁴ Beesley contrasts growing taxi numbers in London, where regulators did not specify a ceiling on taxi numbers, with stagnant figures for Liverpool, Birmingham and Manchester, where quantity limits were regulated.²⁵ Taxi markets without quantity caps do not feature licence values, capped markets do. Beesley disagreed the view entry restrictions confer stability on an industry; output still varies but the cost is transferred to customers. He cited another symptom of deadweight loss in taxi markets. Accelerating growth rates for Private Hire Vehicles suggest regulated taxis do not meet demand.

Beesley tabled the question whether market boundaries would become permeable if regulation allowed intermodal competition. Regulators could enhance scope for innovation by licensing different types of taxi, and leave it to the market to discover whether smaller cars charging lower fares were viable. He also queried the scope for differential fares hailing taxis on the street or booking them by telephone, or by allowing joint rides.

²² Turvey, 1961, p. 91

²³ Coffman, 1977, p. 293, outlines possible disadvantages of regulation: “For example, a regulatory agency may be “captured” by the regulatees, who will turn the power of the state to their own ends, perhaps creating and protecting monopoly power which would not have existed in the unregulated industry.”

²⁴ Beesley, 1973, p. 153

²⁵ Beesley, 1973, p. 155 - 157

Beesley proposed reforms to fare structure by abolishing the so-called Flag Down Rate. This flat fee as a form of two part price discrimination effectively penalizes short haul passengers. Beesley also pointed out that subsidies, present in public transport but absent in the taxi sector, distort demand patterns.

Beesley voiced scepticism whether comprehensive regulation of quantity, quality and price maximised welfare. He pointed out that dynamic markets see changes to input prices, productivity and innovation. In taxi markets regulation stymied these forces.²⁶

Beesley/Glaister (1983) queried whether welfare analysis alone would answer whether entry regulation is appropriate, or whether “free entry is itself desirable because of effects of experimentation, development of market differentiation, new services and prevention of producer-side exploitation.”²⁷ Beesley/Glaister argue the case for entry and fare regulation remains inconclusive as regulators have restricted information on profitability and price elasticity.

Research on Licence Values

Beesley (1973) was first to calculate how monopoly rent contained in licence values adds to fares.²⁸

Fischer (1992) designed an experiment influenced by Vernon Smith’s work on gaming and risk-taking. Test participants traded notional licences in successive rounds of increased licence quantity. Fischer found that increases in licence numbers lead to lower valuation, but the adjustment process is gradual.

Two studies, for Toronto and for Brisbane, have as their premise that licence values constitute a welfare transfer from consumers to licence owners. Wayne Tayler (1989) calculates the surcharge to Toronto fares at 28%, Gaunt/Black (1996) for Brisbane assess a corresponding premium of 15.6%.²⁹ They recommend regulators should track licence values and use this information as a policy tool.

²⁶ Beesley, 1979, p. 112/3

²⁷ Beesley, 1983, p. 597

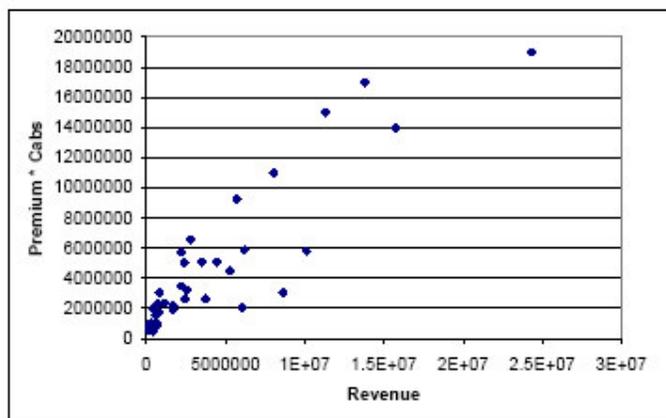
²⁸ Beesley, 1973, p. 159.

²⁹ Quoted in OFT, 2003, Annexe E. See Wayne Taylor: “The Economic Effects of Direct Taxi Regulation of the Taxicab Industry in Metropolitan Toronto,” in: Logistics and Transportation Review, 1989, 25:2, and Gaunt, C/Black, T: “The Economic Effect of Taxicab Regulation: the Case of Brisbane,” in: Economic Analysis and Policy, 1996, 26:1, 151-170.

The Office of Fair Trading (2003) for its review of taxi market regulation commissioned an analysis of licence values in forty Licensing Authorities in the United Kingdom.³⁰

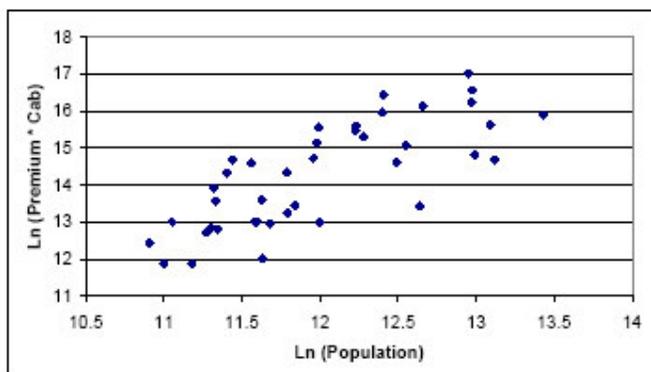
The survey establishes licence values correlate with total annual revenue.³¹

FIGURE 4: PREMIUM*CABS AGAINST TOTAL ANNUAL REVENUE.



A second key correlation exists between licence values and size of population.³²

FIGURE 6: LOG OF PREMIUM*CABS AGAINST LOG OF POPULATION



The analysis summarized its findings: “in restricted hackney markets there is unitary elasticity between annual revenue and the value of the

³⁰ Annexe E “Valuation of Hackney Carriage licence premiums,” in: Office of Fair Trading, 2003.

³¹ Annexe E, p. 29. Halcrow define total value of premium = premium * cabs; total annual revenue = annual demand * average fare.

³² Annexe, E, p. 30

premium, and premia are higher in authorities with larger populations and the zoning of licences.”³³

Summary

When taxi economics emerged in the 1960s, regulation had ring fenced taxi markets from competing modes of transport and defined constraints on competition by restriction of price and entry. A large body of literature takes regulation for granted.

Economists favouring price and entry regulation posit competition cannot bring about equilibrium in taxi markets. Regulation, whilst not ideal, optimizes social welfare. Changes to licence values are peripheral in these discussions. There is no explanation why licence values emerge in the first place.

Critics of entry and price regulation do not condemn regulation per se, but query how changes in the regulatory paradigm could raise social welfare.

Licence values are linked to quantity and fare restrictions, since in derestricted markets they are absent. Licence values are an important piece of evidence to indicate market failure. The rise in licence values has continued since the 1960s, suggesting that market distortions are increasing.

Taxi economists have called for derestriction since the 1960s. Many countries initiated entry and price deregulation in the 1980s. The next chapter reviews the effects.

³³ Annexe E, p. 40

4. Derestriction

Meyer (1971) compared taxi markets in New York and Washington to point out how market design depends on regulatory regime: “The greater number, heavier use, and lower fares of taxis in Washington, D.C., a city which imposes no serious limitations on entry into taxicab operations, illustrate what can be achieved under less rigid regulation.”³⁴

In the 1980s taxi market deregulation was set in train in many countries. These initiatives aimed to provide customers with greater choice, lower prices and larger numbers of taxis. The outcome of these efforts is anything but uniform. The structure of taxi markets has not converged.

The following section provides an overview of deregulatory initiatives. Variances between forecasts and outcomes show taxi economics require further research. This chapter suggests possible areas.

Divergent Patterns of Entry and Price Deregulation

Entry and fare regulation of taxi markets today is remarkably diverse. The following overview ranks a sample of individual taxi markets by their deregulation of quantity and fares:³⁵

Country	Entry Deregulated?	Fares Deregulated?
Sweden	Yes	Yes
New Zealand	Yes	Yes
Netherlands	Yes	Fare Ceilings
Ireland	Yes	Fare Ceilings
United Kingdom	Depends on LA	Depends on LA
Belgium	Depends on LA	Fare Ceilings
Denmark	Depends on LA	No
Germany	No	No
France	No	No

No best practice standard has emerged for entry regulation. Whereas the experience with fare deregulation has been inconsistent, the effects of fare deregulation have flatly contradicted forecasts. In many cities fares

³⁴ Meyer, 1971, p. 356

³⁵ EIM, 2002, vol. I, p. 5

actually increased. Teal/Berglund (1987) have compiled empirical records of outcomes for cities in the United States.

Effects of Entry Deregulation

The number of taxis has increased substantially. Sifting price data from nine cities, Teal/Berglund conclude the supply of taxis had increased by upwards of 18%:

City	% Increase in Taxis Post-Deregulation
Seattle	33
San Diego	127
Sacramento	56
Kansas City	18
Phoenix	83
Oakland	33
Tucson	38

Effects of Price Deregulation

Paradoxically, in spite of increased supply, price increases were higher in deregulated than in regulated taxi markets.

Records are available for US cities:³⁶

City	Increase from Oct 1971 to deregulation		Increase deregulation to Dec 1984	
	Percentage		Percentage	
	Fare	CPI	Fare	CPI
Seattle	38.5	78.6	51.9	45.6

³⁶ Quoted in OFT, 2003, Annexe J, p. 102

San Diego	58.3	78.6	71.8	45.6
Phoenix	66.0	139.6	36.1	9.0
Tucson	122.5	139.6	28.4	9.0
Sacramento	100.0	39.6	13.7	9.0

This outcome defies economic logic. However, it is by no means unique to the US taxi sector. Marell/Westin (1995, 2002) report similar findings for the Swedish taxi market, where quantity restrictions and fare controls were lifted in 1990. Although rural Sweden would seem diametrically opposite to metropolitan America, the outcome of deregulation was remarkably similar to that reported by Teal/Berglund. Prices increased, although at different rates in towns and the countryside.

Mismatch between Forecasts and Outcomes

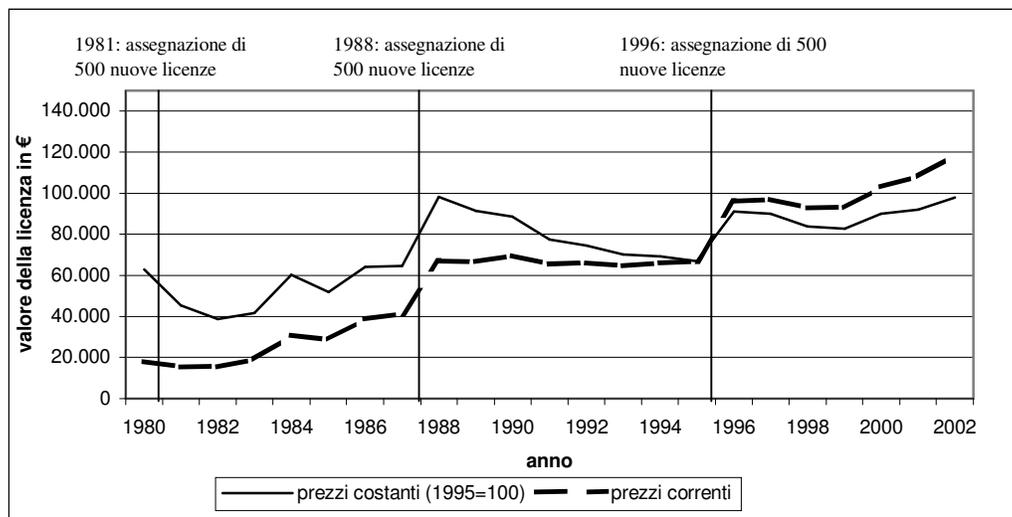
Teal/Berglund discover an unexpected consequence of deregulation, a change in industry organisation. Independent owner-drivers have displaced large fleets from the airport and cabstand market, whereas fleets concentrate on the telephone order market. The authors also note an outbreak of price competition in two oligopolistic markets, San Diego and Seattle, where the second largest fleet offer fares at least 15% below the market leader's.

Teal/Berglund proffer several explanations, such as missing data on operating costs and inelastic demand.

Another possible explanation proffered by Teal/Berglund is the impact of deregulation on drivers' incentives. They note many US drivers lease cars from owners at fixed rates, and surmise fear of income loss make them risk averse and hence reluctant to compete by reducing price. In the case of Sweden, there might be a different reason affecting patterns of demand. In Sweden some 80% of taxi travel is publicly subsidized, e.g. for school runs in rural areas. Presumably this dents the incentive to shop for lower prices.

Regulatory Reform and Licence Values: Rome and Montreal

The price level for licence values would allow inferences about market distortions before and after deregulation. Quantity increases *ceteris paribus* depress licence values, as was apparent in the case of Rome. Rome³⁷



The graph for Rome shows a time delayed drop in licence values following each issuance of 500 new licences in 1980, 1988 and 1992. This experience bears out the effects modelled by Fischer (1992).

Montreal

The devaluation of licence value by entry deregulation has a corollary, in that individual licence values will appreciate when taxi numbers contract. Regulatory intervention in the case of Montreal demonstrates this hypothesis.

In Montreal taxi operators combined to eliminate excess supply of taxis, by buying back and voiding some 25% of licences in circulation (1,287 out of 5,222) at a cost of some Can\$ 21 million. Taxi operators raised the funds for this buyback programme without assistance from the public

³⁷ Comandini, V./Gori, S./Violati, F: 2003

sector. There is unfortunately no research whether the subsequent appreciation of remaining licences is equal or greater than the cost.

Discussion

There is little mention of licence prices in assessments of deregulation. It seems likely most economists take it for granted licence values have no value once deregulation takes effect. The example of Dublin, where deregulation extinguished licence values over night, is a case in point.

The experience with deregulation of entry and fares has not led to a convergence in market structure. It is striking that two markets which restrict entry and fares, Denmark and Germany, feature at the bottom as well as at the top of a list ranking the profitability of individual taxi markets.³⁸

Country	Revenue/Cab in Euro (2000)
Denmark	100,000
Sweden	85,000
Netherlands	45,000
France	56,000
United Kingdom	40,000
Belgium	25,000
Germany	25,000

Need for Research

Whilst Meyer's observation may apply to Washington and New York, developments in markets deregulated since the 1980s are at variance with his implied forecast. The discrepancies between forecasts and outcomes, and the divergences between individual taxi markets, demonstrate gaps in our understanding of taxi markets. Suggestions for research are subjoined.

Intermodal Competition

If there is no obvious correlation between regulatory regime and taxi profitability, another explanation might lie in the relative attractiveness

³⁸ EIM, 2002, vol. I, individual country reports. Revenue/cab figures unavailable for New Zealand and Ireland.

of competing forms of transit. An examination of bus and taxi fares shows that whilst public transport shows a high degree of convergence, taxi rates feature high standard deviation:³⁹

City	5-km taxi ride in €	10-km bus ride in €	<i>Multiple</i>
Amsterdam	11.20	1.40	<i>8.00</i>
Auckland	4.90	1.20	<i>4.08</i>
Berlin	10.50	2.10	<i>5.00</i>
Brussels	6.60	1.30	<i>5.08</i>
Copenhagen	6.70	1.70	<i>3.94</i>
Dublin	7.70	1.10	<i>7.00</i>
London	9.10	1.80	<i>5.06</i>
Paris	7.50	1.10	<i>6.82</i>
Stockholm	8.10	1.40	<i>5.79</i>
<i>Standard Deviation</i>	<i>1.86</i>	<i>0.32</i>	

Cost Structure

Specifically, regulators require information into the sector's cost structure. The discrepancy between reported annual taxi turnover in Copenhagen (Euro 100,000) and Berlin (Euro 25,000) seems baffling.

In many countries reliable information on turnover is not available. Some countries have made substantive progress in this regard. In Scandinavia, for example, computerized taximeters log trips for tax records, record takings and drivers' working hours. Computerized taximeters and odometers would clarify information on the industry's dynamics. Kitch/Isaacson/Kasper believe regulators are hampered by the "ability of the firms already in the industry to remain the only source of information about the industry."⁴⁰

³⁹ EIM calculations based on UBS data

⁴⁰ Kitch/Isaacson/Kasper, 1971, p.343.

Elasticity of Demand

Turvey (1961) had to rely on studies of demand elasticity performed in 1951, and already then had reservations whether they were up to date. Beesley (1979) pointed out research into taxi markets was hampered by a dearth of factual information, “and by far the biggest gap is direct evidence on demand.”⁴¹ For the New York market one of the first published empirical surveys of demand elasticity was performed by Schaller (1999). J. P. Toner reiterated this complaint for the case of markets in the United Kingdom as recently as 2002.⁴²

Technology and Quality Regulation

Technological innovation and how it can invigorate development of taxi markets does not feature in taxi economics. It is plausible to assume that technological progress can transform the economics of taxi markets. Three examples follow.

Satellite Mapping

Satellite-mapping reduces drivers’ reliance on specialized topographical knowledge and facilitates market access by drivers from neighbouring Licensing Authorities. Lack of topographical knowledge is no longer a barrier against admitting PHVs to ply for hire.

Telephony

Mobile telephones are able to transmit roaming calls to the nearest taxi in the neighbourhood. (In London the service is called ‘Zingo.’) This service reduces waiting times and hence search costs.

⁴¹ Beesley, 1979, p. 130

⁴² J.P.Toner of Leeds University’s Institute for Transport Studies in an unpublished discussion note (12. November 2002) for the OFT called for further empirical studies: “We are left with a difficulty: elasticities are what will determine whether the public is best served by entry derestriction (in terms of waiting time benefits); but the necessary information is conspicuous by its absence. I would think that a limited programme of work is necessary to try to establish these key parameters with greater clarity.”

Electric Cabs

Recent developments in congestion charging offer an incentive for differential pricing of taxi services within a defined area. Customers may favour taxis running on electricity in areas where vehicles travel at slow speed and where pollution imposes high social costs.

Summary

One of the basic axioms of economics is that increased supply results in lower prices. Derestriction of entry and fares has not resulted in this outcome. It is plausible to presume there are gaps in taxi economics, inter alia data on the sector's cost structure and demand elasticity.

Michael Beesley (1983) called for abolishing operating licences in favour of free entry, thus enabling experimentation, market differentiation, new services, and preventing producer-side exploitation.⁴³

Given that taxi economics emerged in the 1960s, only after the prevailing paradigm of economic regulation was in place, there is a presumption that taxi economics need to reconsider its market definition, in particular by considering barriers to intermodal competition and how the potential of new technology could be realized to promote innovation.

Taxis in their history have time and again adapted to innovations in technology and customer requirements and competed vigorously against other modes of transport. Price and entry regulation today is as much a shelter as a constraint.⁴⁴

⁴³ Beesley, 1983, p. 597

⁴⁴ Israel Kirzner believes the judge and jury of regulatory effectiveness is whether it promotes competition: "That government regulation diminishes competition is common knowledge. Tariffs, licensing requirements, labor legislation, airline regulation, and bank regulation reduce the number of potential participants in particular markets...The beneficent aspect of competition in the sense of a rivalrous process, as noted earlier, arises out of *freedom of entry*. Freedom of "entry," for the Austrian approach, refers to the freedom of potential competitors to discover and to move to exploit existing opportunities for pure profit. If entry is blocked, such opportunities simply may never be discovered, either by existing firms in the industry, or by regulatory authorities, or for that matter by outside entrepreneurs."⁴⁴

5. Index of Potential Supply

Purpose

This chapter introduces the Index of Potential Supply (IPS).

Regulators in taxi markets with quantity and restrictions often base their decision on changes to taxi numbers and fare levels on an Index of Significant Unmet Demand (ISUD).

Records of ISUD indicate changes in taxi demand from one period to another. ISUD informs regulators how demand for taxi services has changed.⁴⁵ Demand under ISUD is predicated on a prevailing fare structure. ISUD does not inform regulators whether alternative fare levels might expand the market overall.

Regulators lack a tool to gauge the supply side to taxi markets. IPS fills this gap.⁴⁶

IPS

Competition in taxi markets is predicated on prevailing quantity and price restrictions.

IPS models the interdependence of

- fare levels and elasticity of demand, and
- market entry.

Assumptions

IPS assumes $\text{Marginal Revenue} = \text{Marginal Cost}$.

⁴⁵ OFT, 2003, p. 26 explain how Licensing Authorities assess ISUD: “They generally do this by carrying out an ‘unmet demand’ survey, on average every two to four years. The survey mainly involves observation at ranks of the demand for taxis, carried out over a representative period.”

⁴⁶ Kahn, 1988, vol. 2, p. 111: “The equilibrium price for the privilege of operating a taxicab is the price that will just ration the number of available licences among the people who would like to enter the field. Taxicab rates and revenues must be sufficient to provide an acceptable livelihood for the driver plus a return on the \$25,000 investment. Such rates and returns would therefore be excessive if it were not necessary to make that investment; or, to look at the matter from the other end, manifestly more drivers would wish to enter the field if they could do so without paying so high an entrance fee.”

Given that Revenue per Cab is £29,139 this figure defines the threshold for new entry. An increase in industry revenue makes room for new taxis. IPS models the scope for expansion in taxi numbers.

Qualifications

IPS in this particular sample is based on published data quoted by the Office of Fair Trading.

The input is inconsistent. Quantity and fare regulations are not uniform across the country. Specifically, entry restrictions apply to 52% of UK taxis and 45% of Licensing Authorities. The model aggregates figures from all Licensing Authorities, from those which feature restrictions to entry and from those which do not.

To compare like with like, it would be necessary to adjust inputs so that turnover and taxi numbers match. The model is illustrative. However, it applies to individual Licensing Authorities *mutatis mutandis*.

How the Spreadsheet Works

Changes to price levels and to elasticity of demand result in changes to mileage and revenue per cab. Users adjust prices and elasticity by input of values using EXCEL's Data Validation function.

Price levels and elasticity of demand are the model's inputs. The model's output is a calculation of the sequence whereby

1. variations are applied to price and to elasticity of demand,
2. an expansion (reduction) of mileage demand leads to revenue increase or decrease,
3. change in revenue creates conditions for corresponding change in taxi numbers.

Terms of Reference

The Office of Fair Trading has drawn these data from statistics compiled by the Department for Transport for 2003. These statistics aggregate figures for Licensing Authorities of the entire United Kingdom. The figure for average licence values is an estimate.⁴⁷

The data set is subjoined:

PassengerTripsYear	T	12
PassengerMilesYear	PMY	61
AveMilesTrip	AMT	4.7
AveCostTrip	ACT	£3.78
Total Revenue	R	£2,200,000,000
Num of Cabs	NumCabs	75,500
Average License Value	LV	£16,500

Data are used to derive financial ratios on taxi revenue and mileage:

Revenue/cab	"RC=R/Noc"	£29,139
Number of Trips	"NoT=R/ACT"	582,010,582
Number of Trips/Cab	"NTC=NoT/NumCabs"	7,709
AnnualSpendPassenger	"ASP=T*ACT"	£45.36
Revenue per Mile	"RpM=ASP/PMY"	£0.74
Miles per Cab	"MpCab=RC/RpM"	39,186

Explanations of Individual ratios:

- **Revenue/Cab:** Industry revenue divided by number of cabs

⁴⁷ Annexe E to the OFT's report expressly points out this figure is an estimate. In the sample model, the total number of taxis includes taxis from derestricted as well as restricted licensing zones. In markets without quantity barriers, licence values are nil. Calculations of changes to licence values should exclude taxis operating in derestricted zones. However, the model is set out for illustrative purposes only.

- Number of Trips: Industry revenue divided by Average Cost per Trip
- Number of Trips/Cab: Number of Trips divided by Number of Cabs
- AnnualSpendPassenger: Passenger Trips per Year times Average Cost per Trip
- Revenue per Mile: AnnualSpendPassenger divided by PassengerMilesYear
- Miles per Cab: Revenue per Cab divided by Revenue per Mile

How the Model helps Regulators

Licensing Authorities have access to empirical information for their respective area without resorting to external sources and may enter them into the IPS model.

Inputs from their own area let Licensing Authorities gauge the effect of changes to fare levels and of market entry. Licensing Authorities can use IPS as a complement to ISUD.

Changes to IPS from one period to another inform regulators whether regulatory intervention is moving closer to or further from competitive market equilibrium. Regulators could make licence values, together with quantity and fare levels, an object of regulatory intervention.

Summary

IPS serves taxi regulators, in that it

- is a forward looking indicator
- gives a comparator for alternative entry and fare scenarios
- could be aggregated into a countrywide register of licence values
- gives regulators a benchmark to assess the quality of empirical information supplied by operators

- lets regulators model stable licence values, by changing quantity or by changing price (using EXCEL Solver function)
- lets regulators build a record comparing forecasts to outcomes

A printout of the IPS model is subjoined. A spreadsheet is appended on floppy disk.

Implications for Licence Values

The price of licence values reflects scarcity value. In markets where quantity restrictions are abolished licence values are extinguished. License values are linked to taxi numbers. Changes in taxi numbers will affect individual licence values. It appears plausible that increases to taxi numbers will lower licence values. The example of Rome is a case in point. Another example is the case of Montreal, where the buy in of licences raised individual licence values.

It would, therefore, be tempting to infer direct changes to licence values from changes to taxi numbers. One simple approach would be to adjust individual licence values pro rata by the change in taxi numbers.

This approach, however, would be open to criticism. Licence values crystallize the present value of profits accruing to licence owners, rather than of revenue flows to operators.⁴⁸ A model of changes to licence values would require additional information on operators' revenues as well as costs, and how these are split between licence owners and licence users.⁴⁹

⁴⁸ Vicusi, K/Vernon,J.Harington,J: 1995, p. 344: "The market value of a medallion is more than just a rough indicator of the effectiveness of entry restrictions. A medallion's price tells us exactly what the most informed agents believe to be the discount stream of above-normal profits from economic regulation...Specifically, it is equal to the discounted sum of future excess profits that are earned by a taxicab..."

⁴⁹ The need for empirical information has been a persistent complaint of critics of price and entry regulation. Kitch/Isaacson/Kasper conclude from their empirical study of Chicago's taxi markets that rate regulation obstructs analysis of taxi markets: "The rate policy has been designed to set rates at a level where the constricted supply of taxicabs is not visible because the number of taxis demanded is not greater than the number available." Kitch/Isaacson/Kasper, 1971, p. 345

Index Of Potential Supply

Data 2003

PassengerTripsYear	T	12
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AveMilesTrip	AMT	4.7
AveCostTrip	ACT	£3.78
Total Revenue	R	£2,200,000,000
Num of Cabs	NumCabs	75,500
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Derivations derived from Data

Revenue/cab	"RC=R/Noc"	£29,139
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AnnualSpendPassenger	"ASP=T*ACT"	£45.36
Revenue per Mile	"RpM=ASP/PMY"	£0.74
Miles per Cab	"MpCab=RC/RpM"	39,186

Adjustments

Cost per Mile	Miles	Revenue per Cab	
£0.74	39,186	£29,139	Choose Change in Price and Elasticity of Demand
Price Change in % -1	Elasticity in % -15		
New Price per Mile £0.74	Miles per Cab 39,774 Change 587.79	Revenue per Cab £29,280 Change £141	

Industry Revenue and Market Entry

	Revenue	
Before	£2,200,000,000	
After	£2,210,670,000	£10,670,000
Change		
	Number of Cabs	
Before	75,500	
After	75,866	366
Change		

6. Reductions in Licence Values - A case of Regulatory taking?

In cases where regulatory intervention results in diminished values of individual licences, acquirers of licences at previous rates understandably feel aggrieved and argue they are entitled to compensation. If Licensing Authorities adopt IPS as a tool for setting quantity and fare levels, the appreciation in licence values would no longer be automatic. Taxi operators might argue for this reason IPS should not enter the regulatory process.

Already in Georgian England hackney coachmen felt their licences should be treated as assets. Consequently, they sought protection of their property. Licence owners today subscribe to the same view and act accordingly.

The final chapter reviews how authorities have treated reductions in licence values.

The Case against Compensation

Sidak/Spulber (1998) mention four conditions for the recovery of stranded costs.⁵⁰ They expressly exclude taxis from the list of possible appellants for compensation as automobiles are mobile assets which can be redeployed outside the taxi sector. Even if taxi operators were to argue their vehicles are fitted to specifications which obviate alternative use, Sidak/Spulber believe they cannot seek redress as the ‘irreversible investment cannot consist solely of a franchise right to receive supracompetitive returns.’⁵¹

In Britain the legality of licence sales was affirmed in court in 1947.⁵² However, courts reject the view that licence values constitute property rights. A test case in Britain in 2002 for damages resulting from de-restriction and subsequent erosion of licence value was unsuccessful. The court based its decision turned on the differentiation between the economic value of licences and the concept of goodwill. Licence values arise from regulatory intervention in the market, whereas goodwill results from a businessman’s own efforts. It would be inappropriate to

⁵⁰ They are 1. the existence of a regulatory contract, 2. evidence of investment-backed expectations, 3. the elimination of regulatory entry barriers, 4. a decline in the regulated firm’s expected revenues. Sidak/Spulber, 1998, p. 450

⁵¹ Sidak/Spulber, 1998, p. 460

⁵² The principle was established by case law in the case of *R v Weymouth BC ex p. Teletax (Weymouth) Ltd* [1947]

grant compensation for the loss of something which had not come about through the efforts of the plaintiff.⁵³

In Ireland authorities have taken an uncompromising line against claims of deregulatory takings. Quantity ceilings on taxi markets were lifted in 2000 and Irish courts on three occasions rejected subsequent demands for compensation brought by licence holders.⁵⁴ Authorities, whilst rejecting any legal right to compensation, established a Taxi Hardship Panel which has recommended payments of €12.6 million.

The Case for Compensation

The Competition Commission in Italy in March 2004 announced a consultation round to find ways of levelling the field for competition between incumbents and entrants. The Competition Commission suggests auctioning licences and transferring the proceeds to incumbents.⁵⁵ This policy implicitly acknowledges that incumbents have priority claims on the monopoly rent contained in licence values.

In Australia the National Competition Commission in 2000 estimated the cost of licences added one third to average taxi fares.⁵⁶ Different policies

⁵³ R (Royden) v Metropolitan Borough of Wirral (2002), quoted in OFT, 2003, vol I, p. 43. The claimant contended licence values are property and actions which annul their value are confiscatory. The court dismissed the plaintiff because inter alia licence purchases take place on the implied understanding that entry restrictions can be lifted at any time. The ruling is discussed in OFT, vol II, pp. 47-49 The court distinguished between 'goodwill' and the value of licences: "...unlike the normal case of "goodwill" as a business asset, this ' premium' does not arise out of the fact that Mr Royden has built up a reputation or has an established clientele, as might be the case of a business such as a restaurant. The ' premium' arises simply because of the restriction on the number of hackney carriages authorised to ply for hire in the Wirral area. In other words, it is simply the reflection of the value of the local monopoly enjoyed by the existing hackney carriage proprietors and drivers. Royden v Metropolitan Borough of Wirral, para 132, 18 October 2002

⁵⁴ High Court (Ireland) Reports: Costello J. (1992) Hempenstall and Others v. The Minister for the Environment; Geoghegan J. (1998) O'Dwyer and Others v. The Minister for the Environment, Murphy J. (2000) Humphrey and Others v. The Minister for the Environment, Local Government, Ireland, the Attorney General and Others, Carney J. (2001) Gorman, Kearns, and National Taxi Drivers' Union v. The Minister of State at the Department of the Environment, Ireland, and the Attorney General, Dublin, The Four Courts.

⁵⁵ "A first type of measure, which would increase the number of licences, could be to introduce an auction system, after which the authorities could issue new licences to successful bidders against payment of a licence fee. The revenues from this procedure could be used to give a one-off compensation to existing licence holders. Another solution would be to give the authorities the possibility to increase the number of licences by issuing existing licence-holders with a second licence, free of charge. This measure would have the effect of compensating the existing licence-holders for the loss in the financial value of their existing licence. For taxi drivers could sell the new licence, derive an income from it, or use both licences by assigning the new licence to another driver. In order for this measure to be effective, the new licence should be either assigned or used within an appropriate period of time, compatibly with the gradual liberalisation process." Italian Competition Commission, 2004

⁵⁶ National Competition Council, Press release, 29th May 2000.

have been suggested at regional levels, ranging from gradual annual expansion of taxi licences (New South Wales), to a buyout of current licences (Northern Territories). There is no unanimity on treatment of Licence Values.

Summary

IPS provides regulators with a supply side index for adjusting taxi numbers. Changes to quantity of taxis have repercussions on the price of licence values.

Price and entry regulations determine licence values as a second round effect. Once licence values enter into the regulatory process, this process becomes transparent. In substance there is no difference between regulation of prices and entry, and regulation of licence values. As licence owners reap the benefits when licence values go up, they are not immune to the risk of decline.

The prerogative of a taxi regulator to intervene in the structure of taxi markets is uncontroversial. However, even if detriment to licence owners as a consequence of regulatory actions may not be actionable under legal terms, social and political considerations put obstacles in the way of implementation.

Appendix: Travel, Traffic, Taxis

Travel for business or pleasure now is so pervasive it seems hard to imagine the original reason for building roads was strictly military. Romans built the first rudimentary traffic infrastructure in Britain to march their legions to trouble spots quickly. Travel was dangerous. Roman road planners avoided laying roads through forests where it was easy to lay ambushes. After the Romans withdrew from Britain, their road network remained substantially unimproved for over 1500 years. There was little need for one.⁵⁷

Security concerns remained paramount for transport planners in the Middle Ages. The perils of travel can be inferred from King Edward I's instructions in 1285 to clear highways on either side from bushes, which might conceal robbers. Travellers in any event could dispense with roads when they could negotiate terrain rely on horseback, and goods were transported in sacks laid across saddles by so-called 'bagmen.' Travel was not a regular feature of daily life in the Middle Ages, but travellers knew transport was available for hire when needed. 'Hackney' is a term used by Chaucer to describe a horse available for rent.

Traffic spreads wealth, but travel incurs cost. As tracks over time turned into roads, a contentious issue emerged: who would pay for maintaining roads, landowners or travellers? Deliberations in the Middle Ages how to pay for roads revolved around the issue how to split the burdens and benefits of network investment between owners and users. Records from the reign of King Edward III document the conflicting points of view. At first, in 1346, King Edward III decreed that travellers should pay for road repairs, and tolls were set to levy charges. To the travelling public this rule hardly seemed fair. Landowners, after all, also derived benefits and enjoyed opportunities from roads, so by rights they ought to share the financial burden. Some of the King Edward's subjects must have been persistent in pointing out this inequity, for in 1353 he amended his ruling. As homes alongside roads had increased in value, their owners were asked to contribute to repairs. Henceforth transport networks were funded by users as well as by owners.⁵⁸

⁵⁷ Pratt, 1970, p. 10, remarks that Britain's earliest roads were "directly created, and were directly controlled, by a central authority as the outcome of a state road policy."

⁵⁸ Edward III marked another first in English transport history. In 1364 he granted England's earliest road franchise, to Philip the Hermit on Highgate Hill.

Edward III's division of road charges between travellers and landowners seems solomonic. Yet users and owners were not reconciled to bearing this financial burden. Roads suffered neglect. In due course the cost of road upkeep devolved on the non-profit sector, on guilds and on the clergy. This practice had its parallels in continental Europe. France, in particular, took the lead in infrastructure management and French monasteries trained specialists for bridge maintenance. Statuaries of saints on medieval bridges that can be seen to this day are testimony that quality oversight of transport infrastructure in the Middle Ages lay with the church.

The Reformation confiscated ecclesiastic wealth and thereby withdrew financial support from roads. Queen Mary in 1555 overhauled arrangements for road management, granting parishes compulsory powers to requisition materials and labour for road repair. This first comprehensive codification of infrastructure management in England remained in force until superseded by the Highway Act of 1835. The longevity of this tenure illustrates the slow change to traffic management.

In Jacobean England the transport sector was small and transport economics peripheral to wealth creation. Yet even then the economics of transport asserted themselves. For example, King James I in 1623 sought to mitigate wear and tear on road surfaces by restricting the number of horses which could pull a cart. Prices for the strongest horses at once went to a premium and farmers complained about this interference in the market. But inland communication was not yet perceived as a key to wealth creation.⁵⁹ A stagecoach service from London to Scotland, fortnightly at that, began in 1658. Around 1700 a journey from London to Bristol would take almost one week, to Edinburgh two. If a traveller from London on arrival in Edinburgh did not turn back immediately he had to wait two weeks for the next coach. A London to Edinburgh round trip thus took six weeks.

Increased communication between towns required better roads. Common Law required parishes to maintain roads, but gave no incentive for network expansion. A new traffic management model emerged after capital markets developed where entrepreneurs could raise money. The first turnpike trust was established in 1663, franchised by Parliament for a term of 21 years to operate a road as a commercial venture.⁶⁰

⁵⁹ Pratt, 1970, p. 43, observes that traffic adapted to roads, not vice versa.

⁶⁰ In 1773 franchising was legislated by the General Turnpike Act which provided for franchise renewal. The application process for franchise renewal seems to have incurred considerable costs. By the early 1800's Trusts were lobbying for an extension of term from 21 to 31 years.

Parishioners presumably were only too pleased to hand the liability for road maintenance to turnpike trusts, which in turn passed on the costs to travellers. This business model finally accomplished England's first effective nationwide interconnection of traffic infrastructure. By 1838 turnpike trusts managed 22,000 miles of roads.

Turnpike trusts and their fees stirred resentment. Many travellers disputed Parliament's right to restrict freedom of movement. Time and again tollbooths were torn down. Toll rioting was pervasive and difficult to overcome; successful conviction carried a penalty of seven years deportation.

The demise of turnpike trusts came about through changes in the law and competition from new transport business models. In 1835 Parliament abolished statute labour and thus squeezed costs up. At the same time, canals and railways were taking custom from turnpike trusts. Many turnpike trusts fell in arrears with their debt service.⁶¹ Distressed bondholders blamed railways for the ruin of their investment and petitioned Parliament to step in. In the end creditors were paid out and as part of the bailout package the Highway Board in 1872 took responsibility for road management into the public sector. Responsibility for road management had come full circle. As in the Middle Ages, it reverted to the non-profit sector.⁶² Expansion and maintenance of traffic infrastructure once again is managed by a central authority, as it was in Roman times.

The purpose and pace of cross country road building shows that for many centuries travel was not seen as a wealth creator, nor was it realized that convenience and speed of travel would promote commerce. Most people lived and worked in one place all their lives, and except in war the need to travel simply did not arise. Given the primitive state of overland communication, urban conglomerations by their proximity to potential customers gained a competitive advantage over the countryside in wealth creation. It was within cities, rather than in the countryside, that breakthroughs and innovation in traffic management were most likely to occur, and these in turn would promote further growth. Events bore out this assumption.

Around 1600 the two largest conurbations in Europe were London and Paris. Between 1600 and 1800 the London's population grew from 200,000 to 864,000, in Paris from 100,000 to 550,000. These two urban

⁶¹ According to Pratt, 1912, p. 315/6, in 1818 within London there were twelve turnpike trusts operating 210 miles of road. Their revenue was £97,482 and their expenses £98,856.

⁶² Pratt, 1912, pp. 312 – 316 relates the demise of turnpike trusts.

markets were first movers in the development of commercial transport within cities. At each step of development, the same issues arose which have been present in transport planning from the beginning: how to find the right mix of taxation and regulation, and how to make room for technological innovation.

Whilst there was little travel from the capital to the provinces, by comparison municipal traffic within London was brisk. London's main traffic artery was the Thames, where Watermen stood by to ferry passengers. From the beginning traffic in London was regulated, in this case by the Waterman's livery company. Travel on London's streets, on the other hand, was inconvenient and unappealing, and the market for hackneys emerged by accident rather than design. The spur to developing road transport in London was neither comfort nor commerce, but fashion. Queen Elizabeth had once been seen travelling through London in a coach, and her subjects sought to emulate her example. But not everyone could afford a coach of their own, so coach owners spotted a market for 'hackney' coaches. Initially hackneys waited in stables or at designated stands. The earliest hackney stand dates back to 1634 at St Mary's Church on the Strand. Soon demand outstripped supply and hackneys were permitted to ply for hire in the streets rather than wait for customers in stables or at stands.

Hackney coaches met with success. Demand grew rapidly and traffic on the Thames contracted. In 1601 the Thames watermen successfully lobbied for a Bill "to restrain the excessive and superfluous use of coaches." Their efforts slowed, but did not halt, the rise of their rivals. By 1625 London numbered 20 hackney carriages, and their quotas were successively raised:

Year	Number of Coaches	No. of Sedans
1634	20	200
1635	50	300
1652	200	
1654	300	
1694	700	
1711	800	
1771	1000	

Coaches were fashionable, hackneys were not. Samuel Pepys recorded in his Diary his embarrassment at being seen in one by friends. Yet London could no longer do without hackneys and regulations for their use were

drafted. In 1660 Parliament imposed a hackney tax of 20 shillings plus a license fee of £5 to pay for damage to streets. Quality standards were from the start an integral part of hackney regulation. Daniel Defoe in his *Journal of the Plague Year* noted that coaches after taking persons to the pest house were required to be aired for six days. In 1661 Charles II entrusted the regulation of hackneys to commissioners, apparently a comfortable if uneventful sinecure. The poet William Congreve served in this capacity from 1695 to 1707, drew an annual salary of £100, and did not have a word to say about it anywhere in his work.

Londoners had every reason to welcome improvements to travel. In Georgian London a trip from Kensington to St James's Palace would take two hours. Hackneys could not keep up with demand, and intermodal competition was on the heels of coachmen. Sedan chairs, introduced in London by Sir Sanders Duncombe in 1634, were warmly welcomed as they reduced traffic congestion. Contemporaries understood intuitively the intrinsic value of a license. Duncombe, for example, enjoyed a fourteen-year monopoly on sedan rental in London. The widow of a deceased coachman petitioned King George I to keep her husband's license as an asset of his estate. The widow had a case, for the value of a hackney license was hardly trivial. Around this time two entrepreneurs offered the King an annual payment of £2,000 for a twenty one year franchise to farm 800 licenses.⁶³

One of the competitive strengths of hackneys and sedans vis-à-vis ferries was that their business model offered passengers point-to-point transport. Paris had witnessed a parallel development. Coach hire in Paris had originated when an innkeeper at the Inn at the Sign of St. Fiacre started a sideline to his regular business, creating the term 'fiacre' which in some countries even today is synonymous with taxis. If London had taken the lead in developing passengers individually, Paris had an edge for devising means to transport passengers in groups.

A breakthrough in urban transport originated in Paris in 1661. The mathematician Blaise Pascal filed a petition to operate an innovative hackney service. His plan was to operate hackneys along five designated routes in regular intervals. Each coach should be large enough to accommodate several passengers, and each passenger to pay a fixed price irrespective of total occupancy. Pascal's business model had several innovative features: customers met running costs as a collective rather than as individuals, and the travelling public could rely on timetables.

⁶³ Jackman, 1966, p. 131, discusses license values.

Paris' incipient bus service was a success from the start. Its industrial organization differed from London's. The Paris bus sector was managed by a monopoly, the Compagnie Perreau, until abolished in 1791 during the French Revolution. In another contrast with London until the French Revolution a monopoly also managed fiacres.

George Shillibeer in 1829 introduced in London the commercial model of group transport pioneered by Blaise Pascal. The incentive for introducing London's first omnibus was to take advantage of a tax anomaly. Shillibeer had worked in the coaching sector in Paris, and noticed that in England coaches were taxed by mileage rather than by number of passengers. So, by expanding seating capacity on vehicles (eventually some passengers would even sit outside), Shillibeer spread cost across a larger number of passengers and was able to undercut competitors. Shillibeer's horse-drawn buses became a permanent competitor to hackney coaches. Unlike hackneys, the bus sector appeared amenable to large scale industrial organization. In the 1830's out of twenty seven mail-coaches leaving London each day, fourteen were horsed from the stable of William Chaplin, who sold his business on retirement netting some £500,000.⁶⁴

At this point the contest for London's transport market was a three way competition between ferries, hackneys and buses. If bus services competed by innovating pricing policy, hackneys responded by upgrading their competitiveness by technological innovation. Around 1800 Paris saw the first two wheelers accommodating two passengers drawn by a single horse, called 'cabriolets.' In London two entrepreneurs in 1805 acquired nine licenses for operating cabriolets, a term soon shortened to cabs. Traditional coaches now faced on the road competition from two sides, omnibuses on fixed routes as well as nimble, high speed vehicles. Sedans, however, by now reached the end of their useful life.

Coach drivers came to accept that cabs were there to stay. By 1832 hackney licenses were transferable to cabs. The initially colloquial term 'cab' over time became generic and by 1896 London's taxis were regulated by the London Cab Act. Cabs gradually pushed coaches off the road, especially after Joseph Hansom patented design improvements in 1834. Whereas by the late 1820s London was serviced by 1,100 coaches and 165 cabs, by the mid-1840s there were 200 coaches and 2,450 cabs.

⁶⁴ Pratt, 1970, p. 325

Technology was not the only competitive advantage of cabs, pricing played a part as well. Cabs were not only faster than coaches, they were also cheaper. Hackney drivers had always been alert to demand fluctuations and opportunities for differential pricing. Ahead of the coronation of George III, coachmen expected increased demand and announced a rise in peak load pricing. They were rebuked by the Privy Council. Drivers acquiesced only gradually to price transparency in the taxi sector. The first comprehensive market regulation incorporating provisions for fare structures was the London Hackney Carriage Act in 1831.⁶⁵ Only from 1870 were drivers required to place their prices on display. Although now fares themselves were beyond dispute, drivers and their passengers still argued over distances. Until prices as well as distances became obvious, price regulation was ineffective.

London drivers resisted price transparency. When a patent was taken out in 1858 on a device which recorded distances, a so-called Kilometric Register, it was never installed in cabs. Drivers' opposition to price transparency was not unique to London. The invention of the taximeter in 1891 was a turning point in urban transport. Today customers hail 'taxis' rather than 'hackneys.' Drivers were loathe to introduce taximeters. When W.G Bruhn, who invented the taximeter, demonstrated their use to cab drivers in Frankfurt, he was thrown in the river. Taximeters were fitted in six London cabs in 1899 but drivers boycotted their use. In Berlin, on the other hand, passengers patronised cabs with taximeters. Cabs lacking taximeters realized they were losing custom, so by the turn of the century more than half of Berlin's cabs featured this equipment. Customers, not producers, promoted price transparency. Technological progress was instrumental in changing market standards.

Developments in municipal transport also reflected variant models of industrial organization. In this respect, too, London and Paris followed different paths. Whilst in London ownership of the traffic sector was extremely fragmented, in Paris authorities favoured monopolies. Napoleon III's administration in 1853 awarded a thirty year concession for Parisian bus transport to the Compagnie Générale des Omnibus (CGO). The company bought out ten competing bus operators and was consistently profitable throughout the century. In 1855 officials replicated this business model for the taxi trade. The Compagnie Impériale des Voitures des Paris (CIV) amalgamated some 140

⁶⁵ Charles Dickens complained that regulation of fares distorted market clearing. In *Sketches by Boz*, Scene 7, he comments: 'Or why should people be allowed to ride quickly at eightpence a mile, after Parliament had come to the solemn decision that they should pay a shilling a mile for riding slowly?'

competing firms into a single unit. However, unlike the CGO, the CIV never succeeded in gaining overall control of the Paris taxi trade. The CIV was profitable, but it changed its status in 1866 by listing on the Paris Stock Exchange as Compagnie Générale des Voitures à Paris. From then on the Paris bus sector operated as a monopoly, whereas the taxi sector had a hybrid structure, part-monopoly and part-free trade. In 1900 two taxi companies accounted for half of the Paris market, the other half split between numerous individual operators.

In London's free wheeling market, in the meantime, by the 1850's some 800 bus companies were vying for custom. The more rewarding routes had become congested and bus operators reached agreement to trade time slots. Many operators went bankrupt, amongst them Shillibeer. The Paris business model seemed to show the way out of this crisis, and in 1856 an Anglo-French consortium established the Compagnie Générale des Omnibus à Londres (CGOL). By the 1890's CGOL ran 860 of London's buses, its largest competitor 275. In the hackney sector, developments in London's paralleled those in Paris. Efforts to create large scale taxi companies never gained ground.

Whilst hackneys, unlike buses, did not experience radical changes to their industry structure, in the 1890's the hackney sector was on the eve of another breakthrough in technology. The market was ready for the introduction of cabs which dispensed with horses. In 1894 production began in the US of cars powered by electricity, so-called Electrobats. Electricity, rather than petrol, was at the time the most likely contender to replace horsepower. At a competition for motorized cabs in Paris in 1898, only one entrant was fuelled by petrol, the other thirteen were electric. The London Electric Cab Company introduced the first electric cabs in London in 1897. Even after repeated attempts, teething problems with their rubber tyres kept them off the road. There were also legal impediments to technological progress. Until 1896 traffic in Britain was required to comply with the so-called 'Red Flag Law' whereby any vehicle travelling at a speed in excess of 4 mph was required to be preceded by a runner carrying a flag to give warning.

After the turn of the century, petrol-fuelled cabs hit the streets in London, and their success was instant. Consumers accepted petrol-fuelled motor cabs from the start. Several makes were marketed, amongst them Renault and Fiat. In 1906 the General Motor Cab Company (GMCC), sister company of a Paris operation and with French managers on its board, put 500 Renault cars on London's road, adding another 500 the following year. Taximeters were part of standard

equipment. From 1907 to 1908 the number of motorized cabs in London practically quadrupled (from 723 to 2805), in the process sweeping away horse drawn hackneys. Between 1906 and 1911 the number of motor cabs went from 96 to 7,165, the number of horse cabs dropped from 10,492 to 4,386.

Technology transformed the marketplace, with repercussions on property rights and labour relations. The London Cab and Stage Carriage Act of 1907 gave cab drivers the right of access to railroad stations, at that time private property. Station owners in return were entitled to charge an entrance fee. A separate dispute, over petrol charges and whether drivers or owners were liable for them, instigated a drivers' strike. Taximeters, however, were no longer a bone of contention. By this time they had become a standard feature of motor cabs and were there to stay. However, the repeated attempt to introduce taxi operation on a large scale faltered once more. GMCC fell into loss in 1910 and three years later was absorbed by a competitor.

The motorized cab sector emerged simultaneously in other metropolises. In New York, 65 cabs were fielded in 1907. Price transparency was the spur to innovation. It was said at the time the move was prompted by a disgruntled hackney passenger who had sworn never again to be overcharged by a driver. America's most important taxi innovator was an Austrian immigrant who had grown up in Chicago, Johann Hertz.

John Hertz was an entrepreneur who throughout his career pushed out market boundaries. Hertz started the Yellow Cab Company in Chicago in 1907, turning conventional pricing policy on its head by slashing cab fares by 50% and making taxi rides affordable to a wider public. He also improved service standards. Yellow Cab guaranteed waiting times of less than ten minutes and its drivers had dress codes. Hertz was determined to ensure consistent engineering quality of his vehicles and started the Yellow Cab Manufacturing Company. Hertz owed his success to competing via price, quality and vertical integration. He was also conscious that the success of municipal transport business is linked to the quality of traffic infrastructure. Hertz lobbied Chicago's authorities to introduce a new invention, traffic lights, to speed up traffic flows. He was sufficiently convinced of their merit to pay for their installation out of his own pocket.

Hertz learned from mistakes and retreated from avenues which did not lead to success. He sold his taxi factory to General Motors in 1925. Hertz also experimented with car leasing, but when customers did not warm to

renting yellow cars which looked like cabs, the business was spun off into Hertz-Rent-A-Car. In 1929 Hertz sold his taxi interests and retired from the sector.

The technological superiority of petrol-fuelled automobiles had overcome the competition of electric cars and driven horse-drawn cabs off the street within a single decade. By 1920 automobiles were close to winning the contest with a competitor transport mode powered by electricity, municipal streetcars. The world's first electric streetcar had been introduced in Berlin in 1881, and within a few decades had become a feature of urban transport all over the world. In the United States electric streetcars typically operated with a municipal franchise, typically charging a flat fare of 5 cent, colloquially referred to as a 'jitney.'⁶⁶

In 1914 a new kind of taxi service sprung up in Los Angeles when the owner of a Ford Model T pulled up at a streetcar stop, offered passengers a ride for 5 cents, and rode off with his first cargo. Within a year some 62,000 so-called jitneys were competing with streetcars all over the USA. The streetcar sector, facing loss of custom to shared ride taxis, lobbied for restrictions, usually with success. In Philadelphia, for example, an ordinance required jitney operators to put up surety bonds and thereby reduced the number of jitneys from about 1200 to only 8 practically overnight. The opposite outcome occurred in Saginaw, Michigan, where an ordinance omitted the requirement of a surety bond; by 1921 jitneys had driven the street railway out of business. Jitneys blurred the demarcation line between individual and group transport. Streetcars were anxious to ward off this incursion into their franchise. In the long run petrol-fuelled vehicles nevertheless spelled the demise of streetcars, replaced over time by buses.

In the 1920s intermodal competition in municipal transport occurred via differentiated price and quality. Rumours circulated in London John Hertz might cross the Atlantic and instigate a price war. In 1925 the Home Secretary appointed the so-called Two Seater Committee charged with examining the scope for a smaller but cheaper cab. London cabbies laughed off the committee, but when in due course approval for a cheaper tier of cab was granted, prices dropped to the cheaper level. Whilst entry of a new tier of cabs in London was forestalled, other cities saw service innovation. In Paris single passenger cabs charging only half the standard rate were introduced in 1924. In Berlin three wheel cabs charging three

⁶⁶ A jitney is now defined as a privately-owned small vehicle that is operated on a fixed route but not on a fixed schedule.

quarter of regular rates appeared in the late 1920s, and drivers also offered discounts to repeat passengers.⁶⁷

Car manufacturers recognized the potential for volume sales and entered the taxi market. In New York some 25 brands of taxis competed for custom. Status conscious New Yorkers in the Roaring Twenties could even hail a Rolls Royce.⁶⁸ With so many companies vying for custom, a price war erupted, with companies slashing prices in an effort to drive out competitors. The pricing strategy was motivated by expectations of recouping investment through fleet discounts on new cars. The most formidable entrant to the New York taxi market was General Motors. However, vertical integration of cab manufacturing and taxi operation did not prove viable. GM's New York taxi subsidiary was closed in 1929 after racking up losses of \$ 2 million.

If the 1920s had been a decade of experimentation, the 1930s Depression was a period of restriction. From the 1930s onwards the priority of taxi regulation switched to protecting incumbents, instead of protecting consumers. Entry regulation transformed the competitive environment by eliminating contestability. This paradigm change has been traced in considerable detail in a case history of Chicago by Kitch/Isaacson/Kasper.⁶⁹ The following section draws on their work.

Taxi regulation in Chicago until the late 1920s followed the mould set in the 19th century. In accordance with an 1866 ordinance the purpose of fare regulation was to set rate ceilings.⁷⁰ When the Depression set in, demand for taxi rides collapsed, whilst at the same time the swelling ranks of unemployed increased the supply of drivers prepared to undercut prices. Many cab companies folded, survived by those entrepreneurs with sufficient equity to outlast the competition. By the early 1930s two companies, Yellow Cabs and Checker Cabs, controlled 80% of Chicago cab licenses. Morris Markin, a taxi entrepreneur in control of both companies, had been pushing for entry regulation as early as 1929, well before the onset of the Depression. Markin's campaign fell on deaf ears for many years. Markin had been discredited when news leaked that New York's Mayor Walker had been bribed to introduce entry restrictions in New York, by offers of stock in Parmalee, Yellow Cab's parent.

⁶⁷ Armstrong, 1930, pp. 21 – 75 on motorized cabs in London, pp. 209 – 257 on developments in the USA and continental Europe

⁶⁸ The business eventually was bought out by Rolls Royce anxious its brand value might be degraded.

⁶⁹ Kitch/Isaacson/Kasper, 1965.

⁷⁰ The 1866 ordinance had six objectives: raise revenue through license fee, prevent extortionate rates, organize the flow of traffic, set standards of appearance, ensure drivers respect the law, compel financial responsibility. The 1866 ordinance did not concern itself with profitability of incumbents.

Facing a swelling inflow of unemployed offering cab services, the industry lobbied for restriction of entry. Markin's critics argued that taxis should compete for customers, just like any other business. If other businesses could attract customers by cutting prices, why not taxis? In 1932 entry restrictions were overturned and fare cuts followed. The election of Franklin Roosevelt and the advent of the New Deal were harbingers of a new policy. Chicago introduced wholesale entry restrictions and regulations expressly designed to protect the profitability of incumbents in 1934.

Economic regulation of Chicago's taxi sector set the pattern for entry and price regulation, so it is worth examining the relevant sections. Chicago's taxi ordinance guarantees Yellow Cab and Checker Cab a market share of 80%. Future allocation of licenses must respect this share. The ordinance expressly regulates rate increases. Applications for rate increases are triggered when the expense-to-revenue ratio exceeds a specified level. Conversely, taxi operators may put in for more licenses when the ratio drops below a specified threshold. Information on the sector's profitability is provided to regulators by taxi operators, without independent corroboration. Kitch/Issacson/Kasper observe the 'function of idle cabs is to protect Checker and Yellow's licenses so that they will not be reissued to others who might employ them in a competitive rather than a monopolistic fashion.'⁷¹ Rate regulation, originally designed in the interest of consumers, had turned into an instrument to eliminate price competition. If indeed the ostensible rationale of this ordinance was to protect the welfare of drivers rather than of operators, there was no need for regulators to eschew the option to restrict the number of drivers in favour of restricting the number of cars.

Unsurprisingly, passengers were not convinced why these regulations were in their best interest. Neither were cab drivers and in 1937 they went on strike. The same year, cab drivers were unionized by the Teamsters who suppressed criticism against the deals they struck with employers.⁷² The teamsters took control of labour negotiations, drivers were awarded a salary increase, and regulators agreed to a rise in fares. The consensus between owners, regulators and unions sealed off the market to new entrants.

⁷¹ Kitch/Issacson/Kasper, 1971, p. 301

⁷² Kitch/Issacson/Kasper, 1971, p. 326, quote a Chicago Daily News report that cab drivers convening meetings to discuss Teamster functionaries faced "slugers armed with baseball bats and hard salamis, and had their window broken."

Simmering tensions over market entry boiled over after World War II when veterans returned from war and found they could not set up as taxi drivers. In 1947 the Department of Justice filed an antitrust suit against Yellow Cab's monopolistic practices. The Supreme Court cleared the defendant arguing that taxi markets were local, rather than interstate, and thus outside the remit of the Sherman Act.⁷³

Yellow Cab's brush with antitrust legislation did not prevent the company from acting as plaintiff whenever it felt threatened by potential entrants competing for market share. In 1955 the newly formed Railroad Transfer Service in Chicago won a five year exclusive franchise to transfer passengers between railroad stations. Yellow Cab brought a case against the market entrant. The City of Chicago intervened on the ground there was no demonstrable public need for this service. The case ultimately reached the Supreme Court which held for the defendant. Paradoxically, Parmelee during this period solidified its own position in municipal transport by winning a monopoly bus service from downtown Chicago to O'Hare airport.

Operators in Chicago enjoy a perpetual franchise in a market where profits are virtually guaranteed. The paradigm change in Chicago's taxi regulation stood previous practice on its head. Chicago's taxi market since the 1930s has exhibited the traits predicted by critiques of regulatory capture: entrepreneurial energy is absorbed in warding off encroachments on monopolistic privilege, service innovation has come to a standstill, and regulation guards market entry and price competition. The case of Chicago is representative for economic regulation of taxis across the US. Cities all over the US in the 1930s curtailed entry and set the standard for taxi regulation. New York today has fewer medallions than when the Haas Act was passed in 1937.

The hackney sector in its history experienced variegated modes of competition and innovation. Hackneys once competed with ferryman, cabs with buses; customers were offered choice between taxis driven by horses, electricity or petrol; competition occurred via price as well as quality; the sector's industrial structure tried monopolies as well as vertical integration. Today, intermodal competition and innovation is at a standstill.

⁷³ US v Yellow Cab Company, 1947. The case is discussed in extenso by Kitch, 1971.

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