

The impact of taxi deregulation on small urban areas: some New Zealand evidence

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In 1989 the New Zealand government deregulated the taxicab industry. Barriers to entry and centralised fare setting were abandoned. This paper examines the impact of the deregulation on industry concentration and fares in urban areas with populations of less than 100 000. While there appears to be only minor changes in concentration and fares in these areas, the direction and magnitude of fare changes, in particular, appear to be related to the size of the urban centre. Two alternative explanations are offered for this result. Evidence is presented which supports one explanation and indicates that the deregulated taxi market is competitive.

Keywords: taxicab, deregulation

Introduction

In October 1989 the New Zealand government removed restrictions over the number of taxi licences and over the fares that could be charged. For the first time since early this century, people were relatively free to enter the taxicab industry, to provide a range of different services, and to set their own fares. However, the quality controls which set minimum standards for operators, vehicles and drivers were maintained and even, the government argued, strengthened.

New Zealand and Sweden are the only two first world countries to have instituted nation-wide reform of the taxicab industry. In the USA, where the industry is controlled at the state or local council level, deregulation occurred in a handful of cities in the late 1970s and early 1980s.

The objective of this paper is to examine the impact of deregulation on the small cities and towns in New Zealand. Ideally, the impact of deregulation on fares; industry concentration; the number; type and quality of vehicles; productivity; and the range of different services would be assessed. Unfortunately, the ideal set of data does not exist, and so this paper focuses on the impact of deregulation on industry concentration and fares, although some evidence on these other aspects is presented.

Previous research

The literature is not unanimous in predicting or describing the impact of deregulation on fares and other aspects of

taxicab services. Teal and Berglund (1987) examine the impact of deregulation on several US cities and find evidence of significant new entry, an increase in real fares, and a lack of innovation in taxi services. They explain these results by arguing, amongst other things, that there exist barriers to price competition in deregulated taxi markets. The first barrier is in the form of high entry costs, where the cost of radio equipment, personnel, facilities and a fleet large enough to provide a city-wide telephone booking is large enough to present an entry barrier to new fleets. The second barrier to price competition arises as the result of ill-informed consumers who possess insufficient information on the alternative service offerings to place a downward pressure on fares.

Contrary evidence of the impact of deregulation is presented by Gaunt (1995) in an evaluation of the impact of deregulation on the four largest urban centres in New Zealand. That research finds, like Teal and Berglund (1987), evidence of significant new entry. However, this is accompanied by significant reductions in average real fares (i.e. 15–25%), and the development of innovative taxi services. Innovations included the running of mini-buses on scheduled, fixed route services; the use of mini-buses to convey party goers and the like to and from entertainment venues; and the successful tendering for the delivery of mail from New Zealand Post headquarters to distributed sorting centres.

While Sweden deregulated its taxicab industry in 1990, it has been difficult to locate any academic analysis of the impact of the deregulation.

No research appears to exist on the actual impact of

Table 1 The impact of deregulation on industry concentration by size of centre

Population	Total number of taxi companies ^a							Average number of taxi companies	
	Oct 1989	COYS which enter	COYS which exit	Dec 1991	COYS which enter	COYS which exit	Dec 1993	Oct 1989	Dec 1993
100 000 +	23	33	3	53	13	1	65	4.60	13.00
50 000–100 000	8	3	1	10	3	0	13	1.33	2.17
20 000–49 999	9	3	0	12	4	0	16	1.00	1.78
10 000–19 999	14	2	2	14	0	0	14	0.93	0.93
1–9 999	53	15	18	50	8	10	48	0.54	0.48
New Zealand	107	56	24	139	28	11	156	0.80	1.16

Note: ^aThese numbers have been obtained by reconciling a list of operators as at October 1989 with a list as at March 1995. These lists were supplied by the New Zealand Land Transport Safety Authority.

deregulation on centres with populations of less than 100 000 people. The next section seeks to redress this gap in the literature by assessing the impact of deregulation on the industry in small urban New Zealand centres.

The impact of deregulation in small urban areas

Industry organisation and concentration

The reforms of October 1989 meant that in New Zealand any person who is judged, by objective criteria, to be a fit and proper person is able to operate a taxicab service and is issued with a Passenger Service Operator Licence. Taxi drivers must meet similar fit and proper person criteria, as well as successfully completing map reading and area knowledge tests. The area knowledge test has been introduced as a result of complaints, in the major cities (e.g. Auckland), that drivers had a poor area knowledge and poor command of the English language. In a telephone survey of taxicab companies in March 1995, a number of operators commented that these tests are inappropriate in small urban areas where the average operator and driver is a long-time resident of the small area which they know very well.

Vehicles used in taxi operations must hold a current Certificate of Fitness (two required per annum). In one small town (Wairoa: population 5 000), the number of taxi vehicles has fallen from six before deregulation down to one. The operator in that town claims that this was a result of the inability of older cars to obtain a Certificate of Fitness. Any number of taxi vehicles may be operated by a person holding a Passenger Service Operator Licence and the Licence holder must be a member of an approved taxi organisation which provides a 24 hour, 7 day telephone booking service. An operator may be granted an exemption from this last requirement, where it can be demonstrated that demand in that operational area is insufficient to require such a service. These exemptions will only normally be granted to licencees who operate in the less populated centres and where there is no competitor who provides a 24 hour, 7 day service.

Deregulation has resulted in a significant increase in the number of taxi organisations and the number of taxi vehicles operating in New Zealand, but the bulk of this growth has been in the major cities. The total number

of taxi organisations increased from 107 in October 1989 to 156 in December 1993, with 42 of these 49 additional organisations established inside the four largest cities. Table 1 summarises the changes in industry concentration that have occurred since deregulation.

Table 1 shows that deregulation has reduced the level of concentration in centres with more than 20 000 people. Prior to October 1989 most centres with less than 100 000 people were serviced by just one operator. After deregulation, the reduction in entry barriers has seen the establishment of additional operators in the majority of these centres. Not surprisingly, the smallest urban centres generally appear incapable of supporting more than a single operator, and the level of concentration in these areas has not changed. Table 2 indicates, as expected, that the probability that a town has a taxi service is directly related to its size. It also shows that, since deregulation, the proportion of towns with a taxi service has dropped marginally. In the next section we will consider whether the reduced concentration in the larger towns has brought lower fares and whether the unchanged high concentration in the smaller towns has allowed monopoly pricing.

The total number of taxi vehicles increased from 2 762 in 1989 to 4 079 in 1994, and while it is possible to say that the four major cities experienced significant growth in the number of vehicles (e.g. Auckland increased from 947 to 1 525), the available data does not allow an accurate picture of the change in taxi vehicle numbers in the small centres. The government is no longer interested in the number of taxis on the road. There is no require-

Table 2 The impact of deregulation on industry presence in small towns

Population	Number of towns	Percent of towns with a taxi service		
		1989	1991	1993
15 000–20 000	6	83.33	100.00	100.00
10 000–15 000	6	100.00	83.33	83.33
5 000–9 999	17	82.35	88.24	82.35
4 000–4 999	13	61.54	69.23	46.15
3 000–3 999	10	60.00	40.00	50.00
2 000–2 999	19	26.32	26.32	21.05
1 000–1 999	36	16.67	11.11	13.89
1–3 999	4	25.00	25.00	0.00

Table 3 The impact of deregulation on taxi vehicle numbers in selected centres

Town	Pop.	COY	Number of vehicles				
			Total 1989	Total 1995	Sedans 1995	10 Seats 1995	W/chair 1995
Tauranga/ Mt Maunganui	70 803	A	16	22	16	4	2
		B	0	12	6	6	0
		C	0	7	5	2	0
		D	6	7	4	3	0
Total			22	48	31	15	2
Wanganui	41 213	A	36	31	22	9	0
Blenheim	23 637	A	13	16	9	6	1
		B	0	6	2	2	2
Total			13	22	11	8	3
Tokoroa	16 636	A	12	14	13	1	0
Morrinsville	5 634	A	1	1	1	0	0
Hokitika	3 663	A	1	2	2	0	0

ment for taxi companies to report this information, and the government does not attempt to collect it. In order to get some indication of the impact of deregulation on taxi vehicle numbers in these small urban areas, a telephone survey of selected towns has been conducted and the results presented in Table 3. The selected towns represent an even spread across the population spectrum. However, some towns were selected because they represent outliers, which required further investigation. For example, Wanganui is unusual for its size in only supporting one taxi organisation after deregulation. Morrisville is unusual because it saw an exceptionally large (60–70%) increase in real fares after deregulation.

Table 3 indicates that an increase in the number of taxi vehicles has generally accompanied an increase in the number of taxi organisations in the centres with more than 20 000 people. Wanganui is a notable exception to this general pattern, with only the one operator, and a reduction in the number of vehicles servicing this area. The smallest towns have seen little, if any, change in the number of taxi vehicles.

Fares

Taxi organisations are free to set fares, but the fare structure must first be registered with the Land Transport Safety Authority, taximeters must be properly programmed, sealed and tested and the fare structure must be prominently displayed both inside and outside each taxicab operated by the taxi organisation. Industry sources in the major cities indicate that this process imposes at least a two week delay between making the decision to change the fare structure and being able to charge the new fares. It seems reasonable to assume that the much smaller fleet sizes in the smaller urban areas would reduce this delay.

The requirement that taxi organisations register fare changes provides the only relatively complete and systematic access to research data. This research makes use of fare structures registered with the Land Transport Safety Authority at two points in time, August 1991 and December 1993. In comparing regulated and deregulated fares it would be desirable to have access to both a record of fares over an extended period of

time prior to deregulation, and to the number of taxi vehicles operated by each taxi organisation.

The series of regulated fares would provide a firm basis for comparing regulated and deregulated fares, as it is possible that the regulated fares immediately prior to deregulation poorly reflect the level of regulated fares over an extended time period.¹ The number of taxi vehicles operated by each taxi organisation would allow a weighted average fare to be calculated for each licence area post deregulation, to more accurately reflect the general impact on the fares paid by consumers. Unfortunately, other than for Auckland no record of the regulated fares could be obtained and post deregulation taxi vehicle numbers are not systematically recorded by any organisation.

The analysis which follows compares the regulated fare structure and standard trip cost immediately prior to deregulation with the deregulated maximum fare structure and trip cost registered by the established taxi organisations in each centre. That is, those taxi organisations established prior to deregulation are assumed to still operate the largest number of taxi vehicles in that area, and so provide the best available proxy for a weighted average fare.² Table 4 presents a comparison of the regulated (Oct 1989) and deregulated (Dec 1993, in 1989 dollars) fare structures by population size.

There are two significant changes in the post-deregulation fare structures. First, particularly in the larger towns (pop. 20 000–99 999) a number of companies do not charge a phone booking fee. This accounts for the reduction in the average phone booking charge. However, it is possible that these companies have simply shifted all or part of the phone booking charge to the flagfall charge, making non-telephone booked trips more expensive. Second, in the small towns (pop. less

¹ In Auckland, where regulated fares were available for the period 1977–89, Gaunt (1995) found the 1989 real weighted average fare (\$10.69) to be a little lower than the average of the real weighted average fares for the period 1977–88 (\$11.40).

² In Auckland, Gaunt (1995) found that for both Tariff 1 and 2, and over a range of trip distances (2–14 km), the large established taxi organisation lay between 95% and 105% of the weighted average real fare.

Table 4 Comparison of regulated and deregulated average fare structures

Population	Year	Flagfall (\$)	Tariff 1 \$ per km	Tariff 2 \$ per km	Phone \$	Waiting \$ per min	Soil \$
50 000–99 999	89	1.54	1.12	1.38	0.57	0.27	27.50
	93	1.80	1.10	1.32	0.27	0.29	27.30
20 000–49 999	89	1.59	1.13	1.37	0.53	0.28	27.50
	93	1.64	1.09	1.34	0.29	0.26	12.84
10 000–19 999	89	1.60	0.87	0.93	0.59	0.24	27.50
	93	1.64	1.01	1.20	0.45	0.25	32.63
1–9 999	89	1.70	0.88	0.94	0.59	0.22	27.50
	93	1.79	1.00	1.22	0.34	0.26	25.85

than 10 000) regulated single tariff fares appear to have been replaced by a dual tariff under deregulation.

An important issue in comparing the regulated and deregulated charge for a standard trip is the average trip distance, which is expected to depend upon the size of the urban area. In a telephone survey of taxi organisations in the areas listed in Table 3, management was asked to give an estimate of the average fare if calculated over the period of one month. Surprisingly, these estimates do not appear to differ. In Hokitika (pop. 3 663) the average fare of \$5 corresponds with a minimum \$5 charge. In Tokoroa (pop. 16 636) an average fare of \$5.50 was calculated by the operator from detailed records. In Wanganui (pop. 41 213) the average fare was estimated to be \$4.80–\$5.00, and in Tauranga (pop. 70 803) the estimated average fare varied from \$4 to \$8. A fare of \$5 generally corresponds to approximately a 2 km trip. An \$8 fare in Tauranga corresponds with about a 5 km trip.

Tables 5 and 6 present a comparison of regulated and deregulated fares based on both a 2 km and 4 km trip which is telephone booked. Waiting time charges are assumed to be zero and fares are expressed in 1989 dollars. Tariff 1 fares generally apply during the daytime on weekdays (e.g. 6 am–6 pm Monday to Friday) and Tariff 2 applies during the night, weekends and public holidays.

Tables 5 and 6 show that for urban areas with populations between 20 000 and 100 000, deregulation has resulted in small reductions in real fares. However, this reduction is not statistically significant when the mean of the 1989 fares is compared with the mean of the 1993 fares, for the urban areas within these two population categories. Urban areas with fewer than 20 000 people have experienced modest increases in real fares

since deregulation. Only the Tariff 2 fares, in towns with less than 10 000 people, have experienced a statistically significant increase in real fares.

At this point it is appropriate to reiterate that the above analysis compares fixed regulated fares with *maximum* deregulated fares. The fares actually negotiated and charged by drivers may well be less than these maximum fares. Indeed the non-trivial cost of changing the registered fares would appear to encourage taxi companies to register fares greater than they intend to charge. A number of companies interviewed by phone (Table 3) indicated that they provided a discount card to regular customers which offered discounts of 10–20%. It could be, then, that the fare comparisons presented in Tables 5 and 6 overstate the actual deregulated 1993 fares.

The impact of deregulation on taxicab fares in the smaller urban areas of New Zealand is clearly different from the experience of the four largest cities. While Gaunt (1995) reports that the four largest cities experienced significant reductions in maximum fares after deregulation, the evidence here shows that medium sized cities and towns saw only modest falls in fares, and the smallest towns actually experienced modest increases in fares. If anything, it appears that the impact of deregulation on fares is in some way related to the size of the urban area in which it occurs.

Competing theories suggest two alternative explanations for this apparent relationship. The first explanation is suggested by the Economic Theory of Regulation (ETR).³ The ETR asserts that regulation is a commodity produced by governments and for sale to

³ Stigler (1971), Posner (1974) and Peltzman (1976) made significant early contributions to the development of this theory.

Table 5 Comparison of Tariff 1 fares

Population	Regulated fares (\$)		Deregulated maximum mean fares (\$)				Ratio of dereg/reg		Difference ^a between means (<i>t</i> -test) 1993–1989	
	1989		1991		1993		1993/1989			
	2k	4k	2k	4k	2k	4k	2k	4k	2k	4k
50 000–99 999	4.34	6.58	4.31	6.57	4.25	6.44	0.98	0.98	0.46	0.49
20 000–49 999	4.39	6.65	4.26	6.51	4.10	6.27	0.93	0.94	1.28	1.12
10 000–19 999	3.93	5.66	4.21	6.32	4.11	6.12	1.05	1.08	–0.95	–1.20
1–9 999	4.04	5.79	4.22	6.31	4.13	6.13	1.02	1.06	–0.45	–1.00

Note: ^aWhere Levene's test indicates equal variances, a *t*-value is calculated to test the equality of means. Where variances are not equal, a Mann Whitney U is calculated to test the equality of means.

Table 6 Comparison of Tariff 2 fares

Population	Regulated fares (\$)		Deregulated maximum mean fares (\$)				Ratio of dereg/reg		Difference ^d between means (t-test) 1993–1989	
	1989		1991		1993		1993/1989		1993–1989	
	2k	4k	2k	4k	2k	4k	2k	4k	2k	4k
50 000–99 999	4.86	7.61	4.77	7.48	4.69	7.32	0.97	0.96	0.83	1.00
20 000–49 999	4.86	7.60	4.84	7.67	4.60	7.27	0.95	0.96	0.99	0.76
10 000–19 999	4.05	5.90	4.58	7.05	4.49	6.89	1.11	1.17	40 ^c	37 ^c
1–9 999	4.17	6.05	4.65	7.17	4.57	7.01	1.10	1.16	–1.74 ^b	–2.36 ^a

Notes:

^aSignificant at 5%.^bSignificant at 10%.^cMann Whitney U calculated due to inequality of variances.^dWhere Levene's test indicates equal variances, a *t*-value is calculated to test the equality of means. Where variances are not equal, a Mann Whitney U is calculated to test the equality of means.

the highest bidder. Just as a firm manufactures a product for sale with the objective of maximising profit, governments manufacture regulation with the objective of maximising political support. It follows that the taxicab lobby in the big cities, where the industry is large and wealth transfers are potentially enormous, will be far more politically powerful than the lobby in the small towns. Under taxicab regulation, this power will translate to greater degrees of cartelisation in the large cities than in the small towns. Regulated output (number of taxicabs) will be further from the competitive output, and the regulated fares will be further from competitive fares in the large cities. This may account for the significant post deregulation increase in output and decrease in fares in the large cities, and the insignificant changes in the smaller urban areas. We will call this explanation the *political hypothesis*.

The second explanation is likely to be suggested by those who believe that monopoly pricing will occur in markets where there are only one or two firms. That is, in the smaller cities and towns where demand cannot support more than one or two operators, a profit maximising firm will set monopoly output and fares and will seek to enter into a cartel arrangement with any other local firm. While the large cities experience a significant price reduction as a result of the many new firms, the lack of competition in the small centres allow firms to charge monopoly fares. We will call this explanation the *competition hypothesis*.

Which of the two explanations, if either, is best

supported by the available evidence? There are two pieces of evidence which appear to favour the first explanation. First, as can be seen from Tables 5 and 6, prior to deregulation a large disparity existed between the regulated fares in the large cities as compared with the smaller urban centres. Freedom of entry and fare setting have resulted in comparable fares being charged, regardless of the size of the urban centre.⁴ In the absence of any rationale for higher costs and thus higher fares in the large cities, the post deregulation tendency for fares to come together appears to be consistent with the expectation under competitive pricing. If anything, higher costs may be expected in the smaller towns where fuel costs are likely to be greater, and where taxis are likely to sit idle for longer periods of time.

Second, a simple model has been constructed and estimated which suggests a relationship between population and the post-deregulation fare change, but not between the number of taxi companies and the post-deregulation fare change. The model attempts to explain the post-deregulation (1989–93) fare change (CHANGE) as a function of population (POP) and the number of taxi companies (COY) in the town in 1993. A significant negative coefficient for the COY variable would support the competition hypothesis, whereas a significant negative coefficient for the POP variable would support the political hypothesis. The model is estimated using data from 44 towns and cities with populations of less than 100 000 were the largest pre-deregulation taxi company is still operating in 1993. The dependent variable CHANGE is simply the 1993 fare (in 1989 dollars) divided by the 1989 fare for a 3 km trip with that taxi company.

Table 7 shows the population variable (POP) to be

Table 7 Model of post-deregulation fare changes

	Adj R ²	F	Intercept	Estimated coefficients (standard error in brackets)	
				POP	COY
Tariff 1	.069428	2.604059 ^c	1.108135 ^a (.052077)	–.0000027 ^c (–.0000014)	–.002 (.040772)
Tariff 2	.139282	4.479146 ^b	1.350304 ^a (.107731)	–.0000069 ^b (–.0000029)	–.02667 (.084345)

Notes: ^aSignificant at 1%.^bSignificant at 5%.^cSignificant at 10%.

⁴ Using Levene's test of Variance equality, the variance of 1989 Tariff 1 fares are significantly greater (at the 10% level) from the variance of 1993 Tariff 1 fares, and the variance of 1989 Tariff 2 fares are significantly greater (at the 1% level) from the variance of 1993 Tariff 2 fares. This analysis is based on a 3 km trip with the largest pre-deregulation taxi company in all New Zealand towns and cities where the taxi company still operates. In addition, the statistically significant relationship which existed between 1989 fares and population was not present between 1993 fares and population.

significant at the 10% level for Tariff 1 and at the 5% level for Tariff 2. The variable which represents the number of taxi companies is not significant for either Tariff 1 or Tariff 2. Some caution must be observed in the interpretation of these results, given the obvious correlation (multicollinearity) between the two independent variables which serves to inflate the standard error of the estimated coefficients and reduce the significance of the coefficients. The impact of multicollinearity is to present the estimated coefficients as less significant than they actually are, and in this case would seem to strengthen the result that the post deregulation fare change is related to the population of the urban centre.

Summary and conclusion

The deregulation of the taxi industry in the small urban centres of New Zealand has not provided the same degree of output and price adjustment as was evident in the four major New Zealand cities. While these large cities experienced significant new entry and real fare reductions, there was only a modest increase in entry and minor reductions in real fares in medium sized cities, and minor reductions in industry size and minor increases in real fares in small towns.

Two alternative explanations for the inconsistent impact of the deregulation were proposed. The political hypothesis explains the variable price adjustment as a function of the political power wielded by the industry in urban centres of varying size. Prior to deregulation, the industry in the large cities constituted a far more powerful political force, achieving a greater degree of regulated cartelisation than the relatively powerless industry in the small cities and towns. Deregulation results then, in significant adjustments to output and pricing in the large cities but only minor changes in the small centres. The competition hypothesis explains the variable price adjustment as a function of the actual competition possible in each centre. The large cities are able to support a large number of operators, resulting in considerable price competition, whereas price competition does not occur in the small towns and cities with only one or two operators.

The available evidence appears to support the political hypothesis with post-deregulation fare changes related to population rather than the number of competing taxi companies. In addition, post-deregulation fare levels appear to be consistent with competitive market expectations with the elimination of population based fare differences which existed under regulation.

This analysis suggests that, especially in the smallest towns, taxi regulation and deregulation is of little consequence. It is probably incidental to the main target of regulators, the taxi industry in the large cities. Nevertheless, taxi regulation imposes costs on consumers in these areas by inhibiting the ability of market participants to assess and adjust output and prices, by limiting the industry in most areas to a single operator with the subsequent loss of price and service diversity and competition. However, deregulation has not eliminated all regulatory costs. Quality controls over the industry have arguably been strengthened, with operators, drivers and vehicles required to meet specified minimum standards. It remains for further research to assess whether these quality controls actually result in an improved level of safety and, more importantly, whether these quality controls enhance or reduce economic efficiency.

Further research is also required to assess the impact on deregulation on other aspects of the deregulated taxi service such as waiting times, cab service hours, cab utilisation, number of trips, service innovation and costs.

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