



Taxi regulation and the Bersani reform: a survey of major Italian cities

Chiara Bentivogli^{1*}

¹ Banca d'Italia

Abstract

Using data from a Bank of Italy survey, this paper analyzes the Italian taxi market and its recent changes. Local regulations are rather homogeneous, while there is a widespread disproportion, within municipalities advisory committees, between the number of taxi drivers representatives and that of consumers'; indicators of service adequacy are seldom used. Service costs are rather homogeneous across Italian provinces, while there is great variance as to supply and fares. The instruments provided to municipalities by the new Bersani law have been used mainly in major cities. Service increase, achieved mainly through additional shifts rather than through the provision of (free) additional licenses, was often obtained in exchange for fare increases; the use of traffic policies has been almost absent. It is difficult to evaluate the adequacy of local decisions, given the lack of non-occasional information on market structure.

Keywords: Taxi; Regulation; Transport.

*They ought to adapt to the evolution.
For everybody's sake, including their species.*

Patrizio Roversi¹

1. Introduction

As in many other branches of the transport sector, taxi and limousine services (in Italian "noleggio con conducente" – NCC) received recently the attention of the Italian legislator. Even if there are still a sizable regulation and high entry barriers in taxi markets, in the summer of 2006 a new legislation has given to municipalities additional instruments to increase supply.

* Corresponding author: Chiara Bentivogli (chiara.bentivogli@bancaditalia.it)

¹ Interviewed by the newspaper La Repubblica (March 22, 2007) on the project of Bologna municipality to increase the number of taxi licences.

This paper examines the situation, using data from a Bank of Italy survey in the first months of 2007 in 66 main Italian cities. The survey follows the first one carried out in 2004 in the capitals of Italian provinces (Bentivogli, Calderini, 2007), and investigates the links between the choices of the local regulator and the supply and efficiency of the service.

Section 2 summarizes the main characteristics of the service and the different kinds of regulation suggested by economic theory; section 3 presents the national regulatory framework. Sections 4 and 5 analyze the results of the second Bank of Italy's survey on the differences among local regulations and taxi and NCC supply at the territorial level; finally section 6 presents some policy implications.

2. Service characteristics and regulation

From a technological point of view, taxi and NCC services show low fixed costs, sunk costs nearly null, low economies of scale (with the exception of the collateral services of radio-dispatching) and low economies of scope. The cost function, that includes the cost of labour (with very low professional requirements) and the costs of buying and operating the car (the cost of fuel in particular), is greatly influenced by a set of context variables (congestion, reserved lanes, urban density). These same factors can also influence demand, that depends – besides general economic context – on service cost and quality compared to other transport options.

Local transport demand - including taxi, limousine services as well as public and private transport - meets the needs of mobility of residents and of visitors of a city, being a derived demand. In general, the spatial movement of the consumer does not have an utility in itself, but allows her to benefit from goods and services otherwise not available. Consumer's decisions include the destination, the timing, the route, and the transportation mode; the choice of a specific means of transport depends on relative monetary and time costs as well as on the relative intrinsic comfort. For a given price of transportation, the substitutability among the different transport modes depends on several factors: waiting time, relative speed and its uncertainty (variability), private cars access to the different city zones, availability and cost of parking, travel comfort, special needs (disabled persons, heavy luggage, and so on). In general taxi offers a point to point service more comfortable and faster than other means of transportation and without accessory monetary and time costs (for example, it does not require to find and pay for parking), usually with a lower uncertainty on expected transport time. High taxi waiting time and a surface traffic particularly severe can nevertheless make the underground (in the cities where it is available) a strict substitute for taxi.

Traffic control measures – for example the presence in large parts of the city of reserved lanes and parking only for taxi or public transit – can therefore reduce taxi costs and at the same time increase taxi demand. This shows how market equilibria can vary greatly – since they do not move along traditional demand and supply curves that relate the service price and quantity – depending on the contextual factors. More generally the nature of taxi demand, that depends on its price but also on a variety of service characteristics, creates the possibility of multiple equilibria: demand may in fact depend on supply size through its dependence on waiting time (which in its turn depends on supply as well as on the size of demand itself), so that an increase in supply

(for a given fare), by reducing waiting time, can increase demand (the so called Mohring effect).

This point can be clarified through an extremely simplified scheme (Douglas, 1972; Beesley, Glaister, 1983; Cairns, Liston-Heyes, 1996; Lam, Bell, 2003) where in each time unit (for example one hour) there are n taxi circulating in the city ($n=Nh/24$, where N is total licences/taxis number and h is the average number of working hours of taxi drivers) of which E are engaged and V are vacant ($n=E+V$). The demand for trips in each hour² depends on the average fare per trip p , on the waiting time of customers w , on a series of exogenous variables x , among which, for example, the average taxi speed (which is a function of the length of reserved lanes, and so on), and on the level of these variables with respect to that of alternative means of transport (same variables with an a index):

$$Q = f\left(\frac{p}{p_a}, \frac{w}{w_a}, \frac{x}{x_a}\right) \quad p' < 0, w' < 0, x' > 0 \quad (1)$$

where w is waiting time (expressed as a fraction of one hour) which depends on the number of vacant cabs V , and p (the average fare per trip) is a function of current fares and of the average trip time t (fraction of an hour). In every point of time the average number of engaged and vacant cabs will be given by:

$$E = tQ \quad (2)$$

$$V = n - tQ \quad (3)$$

$$w = w(V) \quad w' < 0 \quad (4)$$

For given values of the remaining parameters, it is possible to write the waiting time of the customer as a decreasing function of supply (number of licences and average time of use of cabs) and as an increasing function of demand:

$$w = w\left(Q, t, \frac{Nh}{24}\right) \quad (4')$$

Under the assumption that waiting time elasticity with respect to vacant cabs is constant and equal to one for any level of V , for example if $w=g/V$, it can be rewritten as:

$$w = \frac{g}{n - tf(p, w)} \quad g > 0 \quad (4'')$$

This formulation helps to clarify that changes in supply (through changes in N and/or in h , that represent respectively the extensive and intensive margin of supply change)

² We assume that demand is uniformly distributed during the day.

and in fares – in Italy both fixed by the regulator – do not need necessarily to move in opposite directions. Even in the absence of exogenous shifts in demand curve – due to the local economic context, to the traffic management, and to the quality of taxi compared to that of other transportation services – an increase in supply (an increase in n), will reduce w and increase demand, without implying necessarily a reduction of p .

The size of demand change will depend on the relationship between V , w and E :

$$\frac{\partial E}{\partial n} = \frac{1}{1 - (V/(E\omega))} > 0 \quad \text{where } \omega = \frac{w}{Q} \frac{\partial Q}{\partial w} < 0 \quad (5)$$

is the waiting time elasticity of demand for trips. If demand elasticity is low with respect to waiting time ($|\omega| < 1$), an increase in the number of cabs (n) will generate a less than proportional increase in demand. A low elasticity of demand with respect to waiting time could reflect for example a lack of substitutes among other means of local public transportation, due to a significant fare gap and a low availability of fast public transportation (underground or surface transit with reserved lanes). On the other hand, if demand is very elastic with respect to waiting time, then (for given p) an increase in the number of cabs n will create by itself a sufficient increase in demand.

Assuming that the hourly cost of taxi service is constant and independent of the cab being vacant or engaged,³ the impact of an increase in n on unit profits will depend only on demand sensitivity:

$$\frac{\partial \pi}{\partial n} = \frac{\partial}{\partial n} \left(\frac{Ep}{tn} \right) = \frac{p}{tn^2} \left(\frac{\partial E}{\partial n} \frac{n}{E} - 1 \right) < 0 \quad \text{if } \frac{\partial E}{\partial n} \frac{n}{E} < 1 \quad (6)$$

If the function w is (4''), (6) can be rewritten as:

$$\frac{\partial \pi}{\partial n} = \frac{p}{tn^2} \left(\frac{1}{1 - V/(E\omega)} \frac{n}{E} - 1 \right) < 0 \quad \text{if } |\omega| < 1 \quad (6')$$

The possibility of a relatively inelastic demand with respect to waiting time could explain the strong opposition of taxi drivers to an increase in the number of licences for given fares (see further on). Whilst the interaction between demand and service availability does not imply necessarily a decrease in unit profits (and even less lower fares that, in the strongly regulated settings that characterize the sector, are predetermined too), the incumbents' perception is that demand is not very much sensitive to waiting time and hence to service availability.

On the other hand, the pressure of incumbents in favour of a fare increase implies that they perceive a low sensitivity of demand to fare changes. The impact on unit revenues of a fare increase, given n , will be given by:

³ In short this assumption implies that the main component of taxi costs is the opportunity-cost of labour. Notice that in this case supply changes due to an increase in the number of licences N or to an increase of the intensity of taxi use ($h/24$, where h is the average daily schedule of use of each taxi) will be quite equivalent.

$$\frac{\partial \pi}{\partial p} = \frac{E}{tn} \left(1 + \frac{\eta}{1 - \omega(E/V)} \right) > 0 \quad \text{if } 1 + \eta > \omega E/V \quad (7)$$

where $\eta = \frac{\partial Q}{\partial p} \frac{p}{tE} < 0$ is the price elasticity of demand for trips. Since the right hand side of the inequality (7) is always negative ($\omega < 0$), unit revenues will increase for $|\eta| \leq 1$, while they could increase or fall if demand is very elastic with respect to price. In short, a rise in p produces a fall in demand but also in waiting time and this last variable tends in its turn to influence demand positively. More in general, even if the regulator chooses the level both of p and of n , market equilibrium is determined by the value assumed by waiting time according to demand characteristics and its relationship with supply and demand (the 4'').

The role of waiting time as a variable that adjust the market to equilibrium explains why prices and quantities does not move always and necessarily in opposite directions (as it would be natural to expect given a normal demand schedule). In a competitive market - with free entry in the presence of extra profits and variations in service quantity depending on profitability conditions of the individual operator - price and waiting time will adjust so as to ensure a service availability suitable to demand. In a regulated market, waiting time and the actual use of the service (paying demand) will adjust given fares and service availability (in terms of N and h , usually both fixed by the regulator).⁴

Actually this interaction between demand and supply could also motivate the presence of a regulation in an industry that does not seem to have any feature of a natural monopoly: in a perfectly competitive market the suppliers of the service could not internalize the effects of the presence of vacant cabs on the intensity of demand and end up supplying an insufficient service (Bergantino *et al.*, 2007). This possibility is particularly important with reference to the availability of the service in non standard hours, that might be overlooked by the incumbents and that a regulator could guarantee by fixing minimum service standards (basically, by setting compulsory shifts in some specific hours of the day).

Another critical aspect of the service is that fare fixing by a regulator can by itself favour the meeting of demand and supply: in a hypothetical regime of free competition, where, every time the service is needed, the customer and the taxi driver have to bargain bilaterally for the trip price, the results could be very variable, with a high uncertainty for customers and cab drivers and high search costs that could determine an undersizing of the market (Visco Comandini *et al.*, 2004); this supports the usefulness of forms of regulation specifically targeted at increasing transparency, including the setting (to protect consumers) of maximum fares.

Only in the first of the two cases mentioned here the introduction of entry barriers by the regulator could be justified: it would be a compensation for the obligation to supply the service in times of slack demand. Notice that service obligation characterizes taxis but not limousine services (that do not have a service obligation). Some form of registration of all the operators (taxi and NCC) could be anyway necessary in order to

⁴ Clearly the regulator cannot, in the long run, impose the presence of an "excessive" number of operators or shifts in the market (violating their profitability constraint). Therefore in the regulated market the use of the service will be as a rule lower than would have otherwise.

determine who is authorized to use the reserved lanes: the goal to avoid congestion could be achieved through road pricing mechanisms (and the introduction of parking fees) and not necessarily through forms of limitation of entry of new operators (that entering in the market get anyhow a “privilege” in the use of the road network - a fixed resource - and in particular of the reserved lanes).

This last possibility seems to suggest a possible link between the regulation of the service (in terms of rationing of licences and fare fixing) and other public policies concerning traffic and mobility (Beesley, 1973). In fact, the variables t , x , p_a , w_a , and x_a are influenced to a large extent by local policies. For example the average length of a trip depends on the dispersion in the area of the main interest points of the city and on the proportion between the fixed and the variable component of the fare; from this last aspect, an increase in the trip average price will increase the demand for longer trips (and therefore t) and reduce the shortest ones, if it is achieved mainly through an increase of the fixed component of the fare. Likewise an improvement of mobility conditions for cabs can raise their average speed and reduce t and w (for given n and p). Last, qualitative improvements in transport substitutes can drive down demand for taxi services in favour of other means of transportation and make demand for taxis more elastic (as more easily substitutable) with respect to price and waiting time.

The motivations and the features of the current regulation seem to reflect only partly what indicated so far. The diffused presence of entry barriers seems more linked to forms of protection of the incumbents than to the presence of service obligations: in Italy taxi licences, as well as NCC authorizations, are distributed free of charge,⁵ but in limited quantities, in the primary market, having often a very high secondary market value. The restriction in the number of taxis ends up passing on NCC market, given the indirect competition to taxi service that could derive from it.

Other features of Italian regulation do not seem especially geared to efficiency, rather they seem to derive from some forms of pressure on the regulator (Stigler, 1971). For example, the prohibition to cumulate licences or to create taxi companies determines a dispersion of supply which makes it similar the payoff of each incumbent, facilitating the capture of regulator.

Whichever is the origin and the aim of the regulation, it should require, in order to avoid forms of capture of the regulator and to her benefit, the availability of abundant and accurate information on the structural and cyclical situation of the market (Basili, 2008). There is the need of analyses on consumers' types (residents and visitors, users and non-users, frequent users and occasional ones, business and private users), on their demand elasticity with respect to price, income, and waiting time, on the pattern of services requested in terms of main destinations and average trip length, on actual quality and waiting time, on fixed and variables costs of the provision of the service. Moreover regulation should stem from an evaluation of the role of taxi and NCC in the local public transportation system and from studies on the impact of the different measures of traffic control (parking limitations, reserved lanes, and so on).

Finally, in order to avoid regulatory capture, the level of regulation should be sufficiently “high”. From this point of view the municipal level looks rather vulnerable to capture and not very much representative of customers, given that a big proportion of potential demand is expressed by non residents (Noam, 1982).

⁵ The Bersani law introduced the possibility (*de facto* not much used) of introducing licensing fees for the new operators (see further on).

3. The national legislation

The Italian legislation on taxi and limousine services (NCC) consists of a national law (general policy law No 21/1992⁶), regional laws, and municipal bylaws. In 2006 the general policy law has been partially modified by paragraph 6 of law No 248/2006 – Bersani law).⁷

The changes introduced with the recent legislation try to answer to the widespread protests of customers that complained about the insufficient supply. The need for a reform was strengthened by the poor supply of fast public urban transportation (undergrounds), that tends to increase the use of private cars, with negative effects on road congestion (including parking in prohibited zones) and on average speed of urban public transport by road. The high cost of licences on the secondary market (see section 5) indicated also an excess of demand and the presence of regulation rents. The recent changes in the legislation follow a series of proposals of reform of the sector,⁸ yet they do not modify the general setting. As a matter of fact the law merely offers some additional options to municipalities willing to increase the supply of the service, a power that they already had on the basis of the law of 1992. Moreover some of the options included in the decree initially enacted have been eliminated or substantially rescaled at the moment of turning the decree into a law, following the protests of the taxi drivers; in particular it has been eliminated the possibility for a taxi driver to have more than one licence and the introduction of temporary or seasonal authorizations has been reserved mostly to incumbents.

The national general policy law distinguishes between taxi services, with obligation to park in public spaces and fares regulated by municipalities, and limousine services (NCC), with obligation to park in a garage, non regulated fares, and availability only by phone. Municipalities, on the basis of principles indicated by regional laws, set, by means of specific regulations, the procedures for the service (shifts, and so on), taxi fares, and give taxi licences and authorizations for limousine services.

Licences (authorizations for NCC) are referred to a single vehicle, are given free of charge through an open competition and are transferable. The Bersani law introduces the possibility of assigning licences against payment and in this last case at least 80% of the revenues must be given to the local incumbents. Other ways of increasing supply have also been introduced, by giving municipalities the power to assign (mostly to incumbents) non-transferable specific temporary or seasonal authorizations, allowing incumbents the possibility to use substitutes and additional vehicles for services to specific groups of customers and to provide for innovative services.

Taxi licences are released to individuals (that can be on the artisans' register, associated in cooperatives or consortia) and cannot be cumulated (as mentioned, this was allowed by the previous decree). Municipalities set the requisites for the granting of the licence (authorization for NCC). It is possible for family members to drive the vehicle instead of the car owner, and in some specific cases (holidays, health problems, and so on) to have other subjects as substitutes in driving. For NCC the same person,

⁶ General policy for the transportation of persons through public car and bus non scheduled services.

⁷ Law by decree No 223/2006, converted with modifications in the law No 248/2006.

⁸ The most important proposals have been made by the Agency for the control and the quality of local public services of the municipality of Roma (AGSPL, 2004a), by the Antitrust authority (AGCM, 1995, 2004) and by several academic contributors (for example, Boitani and Bergantino, 2003; Bordignon and Boitani, 2003).

that can also be a private entrepreneur, can cumulate authorizations and hire workers (and have driver substitutes). The law No 248/2006 attributes to municipalities the faculty to extend the use of driver substitutes for taxi drivers when supplementary shifts are established.

Taxi and NCC services are different also in terms of fares (set by municipalities in the first case, set by operators in the second one) and of mandatory service. For taxis, the law of 2006 has reinforced the power of municipalities to set fares for predetermined trips, an option that could increase the transparency and predictability of customer's charges, with positive effects on demand.

The national general policy law provides for the creation of an advisory committee (in regions and municipalities), giving it some powers on the service and on the application of the regulation. The Bersani law also provides for the possibility of establishing a committee for the monitoring of regularity, efficiency and adequacy of the service to demand conditions. In both cases the law provides for the participation of representatives of customers and incumbents. The distinction between the functions of the two committees is not clear. Moreover, the competence of the advisory committee on the evaluation of the application of regulations is improper, given the presence of conflicts of interest among the regulator and some members of the committee (regulated). The other functions seem to be basically common to both of them.

In short, the national regulation sets a barrier to entry and the requisite of registration to the specific roll both for taxi and for NCC drivers.⁹ Once entered in the market, the two types of operators are subject to different operational constraints: for cabs shifts and fares are established by municipalities, there is obligation to park in specific areas and licences are not cumulable; NCC permit holders can freely decide service hours and fares, must park in garages and licences are cumulable. The decision on the specific content of the regulations (shifts, fares, number of licences, and so on) and the surveillance of their observance is assigned to municipalities, that are supported by two committees, an advisory committee (provided by the national law, but with very vague tasks), and a monitoring committee, with better defined tasks, but whose creation is optional.

The types of regulation of the sector at the international level are very varied (OECD, 2007). With reference to the taxi market, in some countries (Sweden, Netherlands, Ireland, Austria, Hungary, Australia, and New Zealand) a liberalization process started in the nineties and mainly abolished quantitative entry barriers of operators. The reductions of the constraints to the societal organization and the liberalization of fares have been less frequent.

Even in the countries where the sector has been more liberalized, no significant market failures have been reported. Sweden and New Zealand started a broad liberalization including tariffs, but keeping some standards on service quality. In Norway, in the areas where there are several competing radio-dispatching firms, there has been a pricing deregulation with a continuation of entry quantity barriers. Local antitrust authority found a fare increase after deregulation, especially in hours and days with low demand. In London new drivers have to take a special driving test and a street knowledge test. In the case of Ireland, the effect of the drastic reduction in the value of the licences after market liberalization induced the regulator to devise forms of monetary compensation for some groups of operators (in other words, it is a

⁹ Roll of drivers of vehicles or water-crafts used as public non scheduled transport services established in the local Chamber of commerce.

compensation for the cancellation of a rent created by the regulator itself). Three years after the liberalization of taxi licences in Ireland it has been created the Commission for taxi regulation, that centralizes at the national level the regulation of the sector. The Commission also carries out surveys on the different types of customers and operators, so as to increase the efficiency and the quality of the service. In 2005 the Commission introduced a single national maximum fare, on the basis of a study that showed the absence of differences in the local costs of the service. In Dublin the elimination of the administrative barriers to entry determined the triplication of circulating taxis in two years without significant deterioration in service quality (Barrett, 2003; Daly, 2004). A similar effect on supply has been registered in New Zealand.

In France, a country that had so far a quite strict regulation, at the beginning of 2008 the Attali Commission proposed to give a taxi licence free of charge to anyone has applied for it up to the end of 2007 and did not get it (thus adjusting effective supply to the potential one) and to authorize the use of the same car/licence by more than one driver (subjecting it only to the observance of a maximum number of hours for each driver, set by law and monitored with devices installed in the car). In municipalities where the evolution in taxi availability did not follow population trends, the prefects could take the mayor's place in the management of taxi licences. At the national level the Ministry of Transport would regulate VPRs (similar to Italian NCC), while in the case of taxis it would be responsible for regulation together with the Ministry of the Interior, so as to avoid the concentration of regulation of the two segments of the market under the same ministry. Despite the renunciation by the French government of the Attali plan after the protests of the taxi drivers, at the end of May 2008 it has been accepted the proposal of the minister of the Interior that provides, among other things, for: i) an increase of more than 25% in cabs circulating in Paris (from 15,600 to 20,000) before the end of 2010, of which 1,200 within 2008; ii) greater transparency in receipts, that will contain details of all fare components applied; iii) a reserved lane on the highway to the main airport.¹⁰

4. Regional and local regulation

In the first months of 2007 the Bank of Italy conducted a survey on taxi and NCC service in 67 Italian municipalities, localized in all Italian regions, with more than 50,000 inhabitants at the end of 2005.¹¹ One of them did not participate to the survey; in some other cases the questionnaire has been returned incomplete. The cities have been chosen also on the basis of their relevance as a tourist attraction; in the case of Venezia

¹⁰ In mid 2008 the cost of a taxi licence in Paris was about € 180,000; many drivers rented a car for about € 700 per week, and at the end of 2007 the tax abatement on fuel reserved to taxi drivers was abolished.

¹¹ The cities where the survey was conducted are: Alessandria, Ancona, Aosta, Arezzo, Asti, Bari, Bergamo, Bologna, Bolzano, Brescia, Brindisi, Cagliari, Campobasso, Caserta, Catania, Catanzaro, Como, Cosenza, Cremona, Ferrara, Firenze, Foggia, Forlì, Genova, Grosseto, La Spezia, L'Aquila, Latina, Lecce, Livorno, Lucca, Messina, Milano, Modena, Napoli, Novara, Padova, Palermo, Parma, Pavia, Perugia, Pesaro, Pescara, Piacenza, Pisa, Pistoia, Potenza, Ravenna, Reggio di Calabria, Reggio nell'Emilia, Rimini, Roma, Salerno, Sassari, Siena, Siracusa, Taranto, Terni, Torino, Trento, Treviso, Trieste, Udine, Varese, Venezia, Verona, Vicenza. Rimini did not return the questionnaire in time. Almost half of the administrations interviewed did not give information on the dates of the second-last assignment of taxi licences and almost 40% on the second-last fare change.

the survey concerned both the land and the lagoon services. Cities have been divided in three groups by population size. Big cities include 5 towns with more than 500,000 inhabitants (Roma, Milano, Napoli, Palermo, Genova). Middle-size cities are 7 and include municipalities with a population between 250,000 and 500,000 units. The survey focused both on institutional aspects (norms, regulatory bodies, extent of agreement procedures among the interested parties, degree of decentralization in decisions) and on the market impact of the regulation in terms of licence number, level and fare structure, and finally on the variables considered by local regulators in order to decide a change in fares or in the number of licences. In this section the results of the survey on the institutional aspects are presented; the next section focuses on market situation and dynamics. The information asked in the questionnaire refer to the situation at the end of 2006.

Beside the national legislation and the municipal regulations, recently Regions have legislated on the matter, due to the new powers given to them by the legislative decree 422/1997 and by the reform of title V of Constitution.¹²

In two third of the cases the Regions issued a specific law, 19% included the matter within the local public transportation regulation (and/or the regional transportation plan), in the remaining cases Regions did not legislate on the subject (Table 1). The Molise Region neither has a regional legislation nor a specific roll in the local Chambers of commerce. In 4 municipalities over 66 there are no local regulations for the sector and 10 municipalities did not answer to the specific question. In one case the Region and in two cases the Province have the power to approve the municipal regulations.

In many cases the local legislation (both regional and municipal) repeats widely and follows closely the national one. The setting of the number of licences (and of NCC authorizations), of the level of fares and their change is left usually to the municipalities, often on the basis of general criteria (see further on). Some Regions, mainly those with important airport basins (in particular Lombardia) have also super-municipal regulations.

¹² The new article No 117 of Constitution does not mention local public transport neither among the matters of exclusive state competence nor among those of concurrent legislation. In this context the Constitutional Court (see decision No 222 of 2005) held that the regulation of this sector falls under the residual competences of the Regions specified in paragraph 4 of the article 117 of the Constitution. Moreover the Constitutional Court has rejected the appeal made by the Veneto Region against article 6 of the law No 248/2006 (concerning taxis) because the norms impugned do not discipline the organizational procedures and the carrying out of the service, but are referable to the cross-competencies in the matter of defence of competition on which the State has exclusive legislative power (see decision No 452 of 2007).

Table 1: Features of local regulation on taxi and NCC (percentages).

<i>REGIONAL LAW</i>		
Yes, specific	Yes, included in the law on local public transportation	No
66.7	19.0	14.3
<i>REGIONAL ADVISORY COMMITTEE</i>		
Yes	No	Total
38.1	61.9	100.0
<i>PROVINCIAL ADVISORY COMMITTEES</i>		
Yes	No	Total
9.5	90.5	100.0
<i>APPROVAL OF MUNICIPAL REGULATIONS</i>		
Only the Municipality	The Province too	The Region too
19.0	9.5	4.8
<i>SUPER-MUNICIPAL REGULATIONS</i>		
Yes	No	Total
14.3	85.7	100.0

Source: survey of Banca d'Italia on the supply and price of taxi service, 2007.

Note: The provinces of Trento and Bolzano have been considered separately.

More than one third of the Regions established advisory committees at the regional level and 9.5% also at the provincial level. 30.8% of the municipalities interviewed did not establish the advisory committee. In the municipalities where it is present, the trade associations (taxi, NCC, radio-dispatching companies) prevail among its members (on average they are more than one third of the total), while the representatives of consumers' associations are a minority (on average less than one sixth of the total; Figure 1).

The high representation of the category reflects the willingness of the local administrations to allow the participation of the many trade unions and trade associations (artisans, cooperatives), of which the industry operators are members. Moreover, the wide range, in terms of political affiliation, of taxi, NCC and radio-dispatching associations present in each city seems to reflect the need of the industry to "capture" the regulator, irrespectively of the political group in power locally at each point in time. Among the main cities, the ratio between representatives of the category/customers' representatives is particularly unbalanced in Torino and Genova (13/1 and 11/1, respectively). In 5 cities consumers are not represented in the committee. Only one municipality does not include in the committee neither operators' nor consumers' representatives.

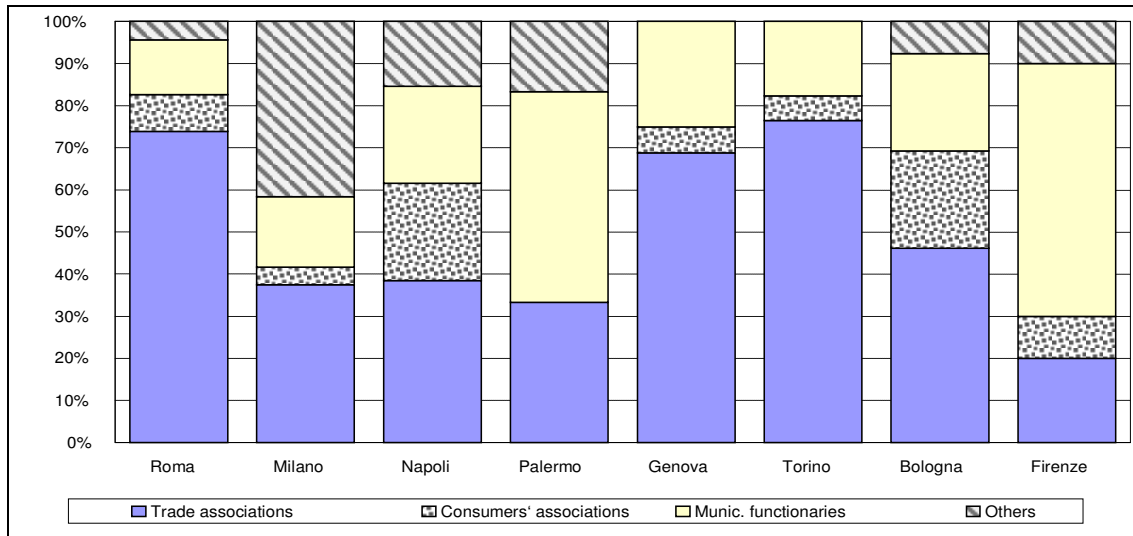


Figure 1: Composition of the taxi advisory committee in the main Italian cities (*percentages*).

Source: survey of Banca d'Italia on the supply and price of taxi service, 2007.

These data can be summarized with a “capture” index, given by the ratio between the number of the operators’ representatives and the sum of the last variable and the number of consumers’ representatives. The index varies between 0 and 100 (maximum capture). Using our dataset it takes a mean value of 68.8 and it decreases with city size: is it equal to 64.9 in small cities, to 74.2 in middle size cities and to 86.7 in big cities.

Only 4 municipalities have appointed the monitoring committee indicated in the Bersani law. With the exception of Pavia, with 2 consumers’ representatives and 1 delegate of the operators, in these committees customers are a minority too. The new municipal regulation of Roma (presented at the end of 2006, revised a year after, not yet approved in April 2009) establishes an advisory committee with 3 experts of the industry, 5 delegates of the category (3 for taxi drivers and 2 for NCC), and 3 consumers’ delegates. In the previous committee there were 17 delegates of the operators and 2 of consumers. It is also established that the town council should present to the governing council a yearly report on the monitoring of the sector.

Local regulations do not mention, with rare exceptions, the use of indicators of demand in the evaluation of the adequacy of the number of taxi and NCC. In the case of the Piemonte region, the regional law gives to Provinces the task to indicate to the municipalities “measures of restraint of licences and of authorizations” on the basis of: population, territory size and other specific characteristics, size of tourism and business flows, relative supply of other local public transportation, other salient factors for local transportation of persons. The Province of Novara, for example, elaborated specific formulas of congruity of taxi and NCC supply. The law of Umbria Region specifies that taxi and NCC numbers must be decided by municipalities on the basis of population size and on the relevance of tourism, business, social, and cultural activities in the cities and in the surroundings, on the distances among urban poles (railway station, centre-periphery, and so on), and on supply of local scheduled urban and suburban public transportation. The regional laws of Valle d’Aosta and Veneto specify that the regional council sets the maximum number of licences and/or authorizations for each area on the basis of indicators. The Veneto Region requires that at least 5% of licences is given for the transportation of disabled persons. In Lazio and Emilia-Romagna the setting of the criteria is attributed to the Provinces.

In most cases the more recent decisions to assign taxi licences and/or NCC authorizations have not been taken on the basis of market indicators (68.7% of interviewed municipalities). A small share of municipalities answered they took into consideration generically demand (10.4%) and a similar share of municipalities specified instead the group of indicators used. A 2003 study of the province of Parma estimated the effective need for taxi and NCC on the basis of the average ratio of service supply/population of similar Italian provinces (and detected a shortage). In Parma it has also been estimated future yearly demand on the assumption that its average increase would be similar to that of total demand for mobility in the region Emilia-Romagna (3%), that should concentrate on public transportation. In the same year the Region Lombardia presented an analysis comparing demand and supply in the airport basin and in the Milano area that points out the need of a different articulation of shifts and of a limited increase in the number of licences. In the survey of Banca d'Italia only in one case the new licence issue has been based on a specific request of the operators.

5. Situation and dynamics of the market

The analytical scheme of section 2 shows that the main variables describing a taxi market are price (more in general the fare structure), the level and the distribution of effective supply in the area and in the daytime, the demand characteristics and in particular its relationship with the waiting time function. A second group of relevant variables are potential demand and unsatisfied demand (that give information on the height of barriers to entry), potential supply (that gives information on rents), and service costs. A third group includes the context variables (extension and characteristics of the territory and of the urbanization), the availability of strict substitutes for public use (km of underground) and local policies already implemented that can influence the efficiency of the service (length and degree of traffic restrictions in the traffic limited zone, reserved lanes, and so on).

With reference to this last set of variables, the sample of the cities included in the survey of Banca d'Italia is quite diversified. The size of the land area of each city is very different even inside the same class-size of the cities. Roma is seven times wider than Milano; Ravenna is the second Italian city in terms of square kilometres. In some small cities (Bergamo, Siena, Pisa, and Pavia) the traffic limited zone is wider than in Firenze. Among the first 10 cities in terms of population 5 have an underground network (Roma, Milano, Napoli, Genova, and Torino). Among the big and middle-size cities in the sample, Firenze and Bologna have the wider traffic limited zone in km per inhabitant (10.11 and 8.43 square metres per inhabitant, respectively), followed by a second group (Palermo, Napoli, Verona, and Roma, with 5.66, 3.49, 3.43, and 2.44 square metres/inhabitant).¹³

In the following sections there will be presented some information on the two group of variables.

¹³ The data quoted here are taken from Istat.

5.1. The number of taxi licences and NCC authorizations

The results of the Banca d'Italia survey indicate that the average number of taxis per 10,000 inhabitants is 20.8 for the big cities, 12.2 for the middle-size ones, and 3.4 for the small ones (Table 2). For NCC the ratio with respect to population is on average 2.3, with a more homogeneous distribution with respect to that of taxi. The variance is quite high also inside each group of cities (Figure 2).

Table 2: Distribution of taxi and NCC supply in the main Italian cities.

Type of city	Taxi licences per 10,000 inhabitants				NCC authorizations per 10,000 inhabitants	
	Mean	Minimum	Maximum	Coefficient of variation	Mean	Coefficient of variation
Small cities	3.4	0.7	12.1	0.6	2.0	0.6
Middle-size cities	12.2	3.9	35.1	0.8	3.9	0.6
Big cities	20.8	4.8	37.1	0.5	2.4	0.4
Total	5.8	0.7	37.1	1.2	2.3	0.7

Source: survey of Banca d'Italia on the supply and price of taxi service, 2007.

In general taxi availability is weakly correlated with NCC supply (the correlation coefficient is equal to 0.24), and there are on average 7 NCC available every 10 taxis. Yet the ratio between NCC and taxi tends to be inversely related with city size (from 0.2 for big cities to 0.5 for middle-size cities to 0.8 for small ones¹⁴), and it is higher in tourist centres where demand fluctuates seasonally. This plausibly reflects the fact that in these cases it would be costlier to set up a service with specific obligations (shifts, and so on).

Relating licences to resident population allows to scale the data of the different cities but does not give precise information on service adequacy with respect to potential demand. An effective regulation, that does not want to take the risk of restricting supply excessively, should be based on a careful examination of demand conditions and of service profitability in the different hours and periods. In Italy the surveys done to this end are very rare.

In Roma two surveys on residents have been conducted. The first one showed an average unsatisfied demand (because the interviewed person could not find a vacant taxi) of 20%, with peaks up to 27% in December, waiting time from 4 to 24 minutes (on average 15 minutes for the suburbs) and a ratio of non-dispatched demand by the radio-dispatching centres of 20-30% (Sta, 2001). The second, conducted by the Agency for the control and the quality of local public services of Roma (AGSPL) in 2003, found that: i) 18% of residents use taxis (on average one trip every two months); this means that more than 80% of interviewed people never or hardly ever use taxis; ii) more than 8% does not use taxis (or does not use them more frequently) because it does not save enough time, more than one third because taxis are too costly, 10% and 5.4%, respectively (among those that use them in the area of residence or in the area of work) because it is difficult to find a vacant one (AGSPL, 2004b, 2004c). A survey done by ACI-Eurispes (2006) finds that 1.2% of interviewed people use taxis often or

¹⁴ Among these cities, the 6 with a ratio NCC/taxi particularly high are: Potenza (5), Perugia, and Ravenna (2.2), Campobasso (1.7), Novara (1.6), Bergamo (1.4).

systematically and 79.2% never turns to them. A survey by Altroconsumo (2007), conducted in the last months of 2006, finds a particularly long waiting time at the main railways stations' parkings and at the airports of Bologna, Firenze, Milano, and Roma.

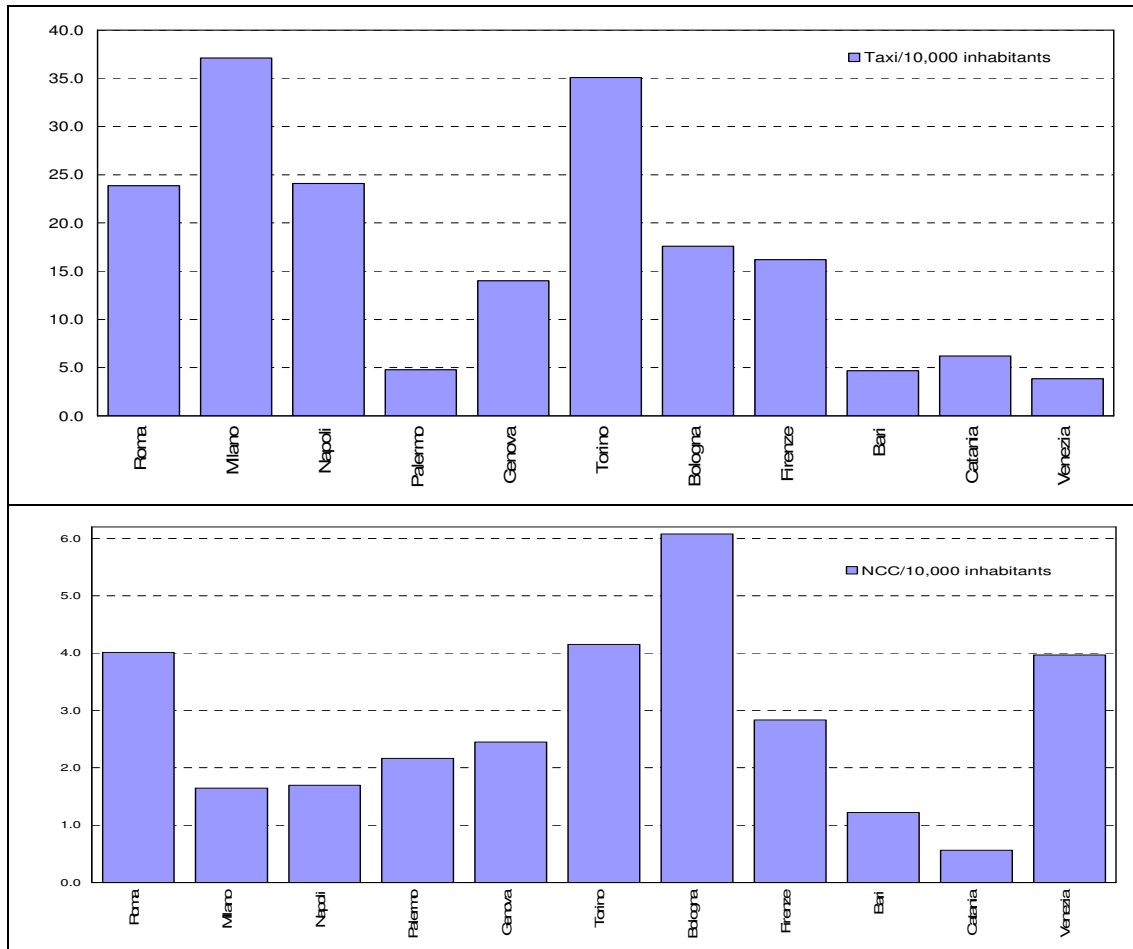


Figure 2: Distribution of taxi and NCC supply in the main Italian cities (*taxi and NCC per 10,000 inhabitants*).

Source: survey of Banca d'Italia on the supply and price of taxi service, 2007, and Istat.

Note: For Venezia only land licences are considered.

In Table 3 we tried to supplement the simple ratio of licences to population in the municipality with other indicators that could proxy potential demand such as the number of firms, tourists, occasional or frequent visitors of the city for study or business purposes, the territorial extension of the territory, the presence in the surroundings of an airport or of trade fair facilities, the subway extension, and so on. For simplicity, we consider only the 11 greatest Italian cities (in terms of population).

The table shows that often the ordering changes with the indicator considered. For example for Milano the index based on municipality population exceeds that of Roma by more than 50%, but it is very similar to the latter when the provincial population is considered, and reduces further if the provincial firms are taken. The relative position of Bologna moves down from the fifth to the tenth position if instead of population (provincial or of the municipality) one takes the firms number. In the case of the ratio licences/tourists Roma falls to the fifth place, after Milano, Torino, Napoli, and Genova. The capital looks relatively more deficient of taxis also if one consider as a scale

variable the number of airport passengers, falling at the fifth place, and Milano falling to the seventh one.

Table 3: Distribution of taxi supply in the main Italian cities with respect to several reference parameters (*indices: Roma=100*).

Municipality	Population resident in the municipality	Population resident in the province	Licences/municipality population	Licences/population of the province	Licences/firms in the province	Licences/tourists' arrivals	Licences/airport's passengers
Roma	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Milano	51.4	96.8	155.6	82.6	52.9	139.6	88.4
Napoli	38.6	76.8	101.1	50.8	179.0	123.6	267.5
Palermo	26.3	30.9	20.0	17.0	96.7	39.9	43.0
Genova	24.3	22.1	58.8	64.7	111.0	106.0	464.6
Torino	17.0	56.0	147.1	44.7	51.2	137.3	270.2
Bologna	14.7	23.8	73.7	45.5	45.2	68.4	95.4
Firenze	14.4	24.2	67.9	40.4	56.8	23.0	222.7
Bari	12.8	39.8	19.6	6.3	17.6	37.1	45.1
Catania	11.9	26.8	26.1	11.6	63.8	39.6	20.1
Venezia	10.6	20.8	16.2	2.2	98.9	8.2	12.2

Source: survey of Banca d'Italia on the supply and price of taxi service, 2007, Istat, and Assaeroporti.

Note: Data on population resident in the municipality refer to the end of 2005, data on population resident in the province refer to the end of 2006. Data on firms refer to 2004 (database Asia), tourists refer to the province and to 2005, airports' passengers data refer to 2006 and exclude transits. For Venezia only land licences are considered.

In dynamic terms these data show that, while population was basically static in the last ten years, almost always the other indicators of potential demand had an expansionary trend. For example, between 1991 and 2006 passengers' traffic at the airports more than doubled in Roma, almost tripled in Milano (exceeding 30 mln in both cases), more than tripled in Bologna. In Venezia the increase has been greater than 300%; even higher growth rates have been registered in some minor airports, among which Bergamo (from almost 250,000 to more than 5.2 mln), Treviso (from more than 84,000 to 1.3 mln), and Forlì. From 1990 to 2005 tourists' arrivals in the respective provinces tripled in Milano, Venezia, and Roma (in this last city they went from 5.5 to 17.4 mln), in Bologna they increased from a little more than 1 mln to 2.7 mln. Last, in 2000-04 the number of visitors to Italian trade fairs increased on average by 11.5% (Censis, 2006).

Against these phenomena, the adjustment in the supply of taxi and NCC has been fragmentary and very limited. 41.8% of the municipalities in the sample assigned the last licences more than 20 years ago (43.3% for NCC; Figure 3).

For taxis 12 municipalities never had selections for the assignment of new licences or last selections date back to the sixties; 6 municipalities did not give any answer to this question. In the 5 years preceding the survey there is a resumption of taxi licences assignment for about one third of the municipalities. A similar trend is found for NCC, for which a little more than two fifth of the municipalities issued the last authorizations more than 20 years ago and a similar share did that in the last 5 years (no authorizations have been issued from 16 to 20 years ago). In the more recent years (before the Bersani

law) it seems that municipalities tried to increase the service mostly through new NCC authorizations. Yet it does not emerge a clear relationship between the recent issue of licences/authorizations and relative shortage (in terms of the ranking of the city by level of NCC authorizations previous to the new issue). Among the municipalities that issued them more recently, only 3 had more taxis than the average.

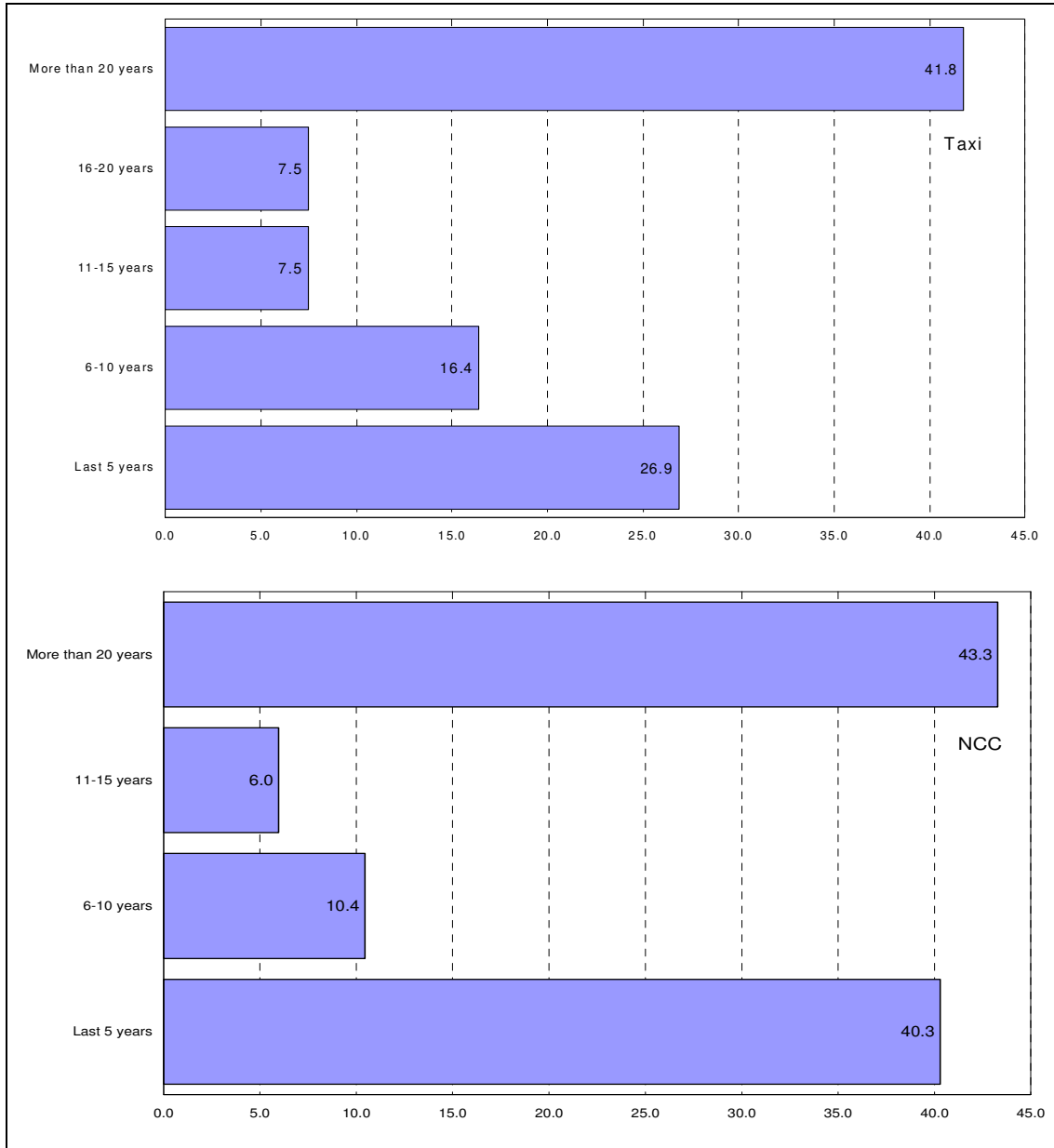


Figure 3: Number of years since the last assignment of taxi licences and NCC authorizations (*percentages of municipalities interviewed*).

Source: survey of Banca d'Italia on the supply and price of taxi service, 2007.

Note: For Venezia both land and lagoon licences are considered. Data on licences issued more than 20 year ago include no answers.

The criteria chosen by municipalities to rank applicants for licences/authorizations assignment are of various kind. Among the preferential qualifications of applicants, very often the more relevant one is to have been a substitute driver for a certain amount

of time. In this way family members of the drivers are favoured, given that they have higher probability of having done this for some time. Generally in the main cities and in those preferred by tourists the knowledge of a foreign language is positively valued. The choice of other preferential qualifications goes from the educational degree (this is the case of Roma municipality in 2001 selection) to the registration in the unemployment or mobility rolls (regulation of the Reggio nell'Emilia municipality) and includes sometimes indicators of the dependency burden.

After the Bersani law there have been no generalized changes in the industry. Yet the main cities implemented some relevant initiatives. In some of them the monitoring committee has been introduced. Among the most interesting innovations, in Roma there has been an increase in the number and in the length of shifts, in the cases where it is possible to use substitutes in taxi driving. As a whole these measures should have increased the effective service in peak times of about 2,500 taxis. The municipality has also assigned to Censis research institute a study on the evaluation of taxi necessity in town and to ATAC spa a feasibility study of a technologically advanced monitoring system. After the taxi drivers representatives showed their opposition to the use of any satellite control system, the municipality issued (free of charge) about 1,950 licences (until the first half of 2008) and intended to issue 250 more before June 2009. When all this project will be concluded, the number of licences should be higher by 30%. In Milan the increase in the service supply has been obtained by a reorganization of shifts, also with the option of drivers to hire drive substitutes. Service monitoring has been done through remote connections with the radio-dispatching centres. In Firenze 60 new licences have been issued together with 30 temporary ones (+15.2%), the shift time has been increased and new types of service have been introduced. In Bologna, were no new licences have been issued since 1983, in March 2007 there has been an agreement of the municipality with taxi representatives to issue (for a fee) 42 licences (+6.4%, from an initial proposal of about 130), part of which will be used for preferential service for disabled people. In June 2008 the municipality opened a competition for 41 licences, of which 23 for disabled preferential service (sold for € 150,000) and 18 with some restrictions on the service (type and area of demand, sold for € 125,000), and a rebate of € 12,500 in the case of the use of a hybrid and/or electric vehicle. 90 people applied for the licences.¹⁵ Licences have been assigned in March 2009 (two years after the agreement). In Modena an agreement between taxi drivers and the municipality (April 2008) provides for the issue of 10 licences (for a fee) and 5 temporary licences together with a fare increase of 8.5%. In Perugia the municipality has planned to issue 8 new licences (+28.6%), while in Siena it has been introduced the possibility to have more shifts per car by hiring driver substitutes; in the mid of 2007 a selection started for 2 taxi licences and 3 NCC authorizations. In Napoli the municipality carried out a survey to evaluate taxi availability in taxi ranks in the different times of the day. In Pisa in 2007 12 new licences have been issued (+25%). In Palermo 80 licences were already assigned in 2006 (+30%), after a selection started in 2005.

Beside the supply increase, the municipalities of Roma and Milano implemented some policies to improve the service, among which the creation of a single telephone number for calling taxis at their ranks and some measures to contrast unauthorized

¹⁵ The cost of licences has been set at a level lower than the secondary market price given the constraints associated to these new licences. If demand is greater than supply the municipality selects applicants by testing them on their knowledge of the area (roads, cultural sites and so on), of a foreign language and by assigning some points to the school degree attained and to the status of unemployed.

service. In Milan the agreement of November 2006 with the operators associations also provides some measures to improve taxi mobility (increase of reserved lanes, enforcement of controls for the no parking and restricted traffic areas, activation of new cameras). Moreover the municipality introduced subsidies for the renewal of the car pool, of radio equipment, the installation of POS facilities, the use of satellite navigator systems, and so on (Ministero dello sviluppo economico, 2007).

Other indicators of supply adequacy can be derived from the presence of entry queues and of rents arising from the possession of a licence, licence that is primarily distributed for free. From the first point of view, an indication can be drawn from the number of subjects with the minimum requisites to participate to a licence issuing session (in Italy the registration to the specific roll established in the provincial Chambers of commerce) and from number of applications to the public contests for a licence.

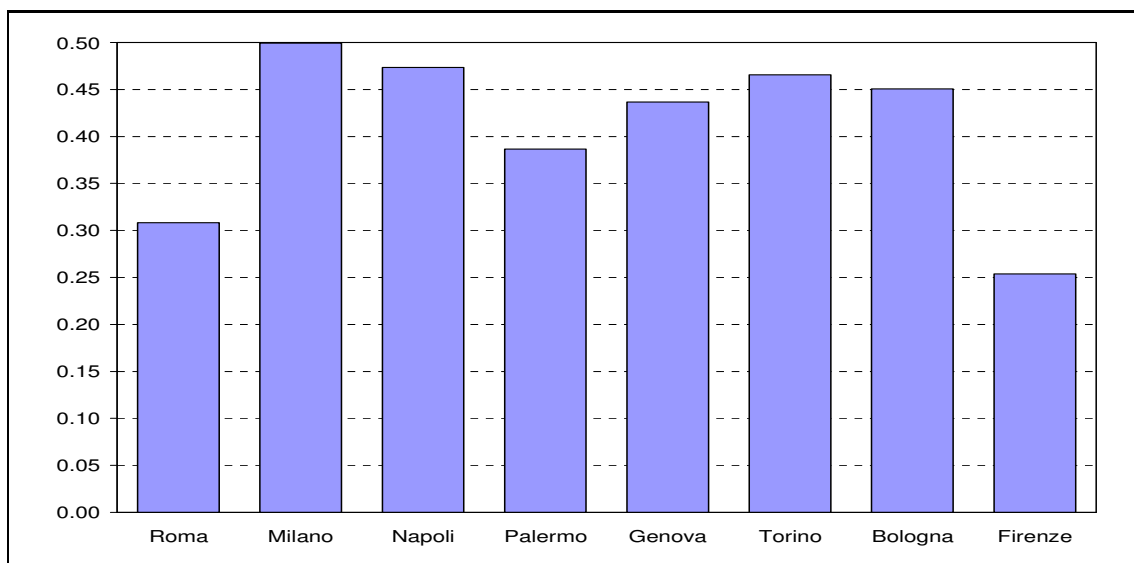


Figure 4: Ratio of taxi and NCC over the number of persons registered in the rolls of drivers for non-scheduled transport services.

Source: survey of Banca d'Italia on the supply and price of taxi service, 2007.

The survey shows that in the main Italian cities for each licence holder there is at least another subject registered in the roll established in the provincial Chamber of commerce that could, potentially, participate to the municipal contests to allocate licences or NCC authorizations (Figure 4).¹⁶

Information on the price of licences on the secondary market are scarce and sporadic. The only one done systematically has been carried out in Roma in 2003 by submitting a questionnaire to a sample of operators, and asked for information on the period 1980-2002. The survey shows that, compared to an average investment in real estate in Roma municipality, from 1986 to 2002 the purchase of a taxi licence would have had a higher yield by about 0.5 percentage points (Visco Comandini *et al.*, 2004). The recent value of licences varies, according to various sources, from € 50-60,000 in Bari to € 300,000 in

¹⁶ This indicator has a limited informative capacity because it is influenced by the licences availability on the secondary market, by the diffusion of driver substitutes (registered in the rolls too) and by the time proximity of new contests (in that case normally there is an increase in registrations). This information has been given very partially by the municipalities interviewed: 12% of them did not give any information, in 3 regions the roll has not been created and in Friuli-Venezia Giulia the roll is regional instead of provincial.

Firenze; according to a survey of the municipality, in Bologna the licences value is around € 250,000 for taxis, and € 125,000 for the NCC.¹⁷

The actual supply of taxis does not depend only on the number of licences, but also on the possibility and the actual use of the same vehicle by drivers' substitutes, on the number of shifts and hour ceilings fixed by local regulation, and on the actual schedule of individual taxi drivers. The number of service hours guaranteed in a typical working day (vehicle-hour) can therefore vary considerably with respect to the number of licences too, according to municipal regulations. If, as in the Italian case, one licence corresponds to one vehicle (but it is possible in some case the use of driver's substitutes), the potential maximum supply is given by having all vehicles circulating 24 hours a day. With respect to this potential ceiling, the regulation sets compulsory and optional shifts, maximum working schedules for the individual taxi driver (for example 9.2 hours in Napoli, 10 hours in Roma, 12 hours in Torino, Genova, Bologna, and Firenze) and limits to the possibility of using driver's substitutes.

It is likely that if in this type of choices operators have a wide margin of action, they would choose a schedule that concentrates taxi availability in the hours of higher demand, at the expense of non-peak hours. The Banca d'Italia survey indicates that for about one third of municipalities shifts are organized by the operators' organizations and in a little more than 12% of the cities shifts are not regulated; in Palermo there are regulated shifts only for the airport service.

Another aspect which is relevant for the actual availability of the service is the choice of drivers to work in the optional shifts, and the possibility for the municipality to monitor the actual service provision in the compulsory shifts and the compliance with the hours ceiling. While it is basically impossible to verify the actual work of the operator in the established shifts (in the absence of remote control mechanisms on the use of the vehicle), it is quite simple to check the extra work. The actual supply is therefore undetermined to a great degree, and, where they have been set, the hour ceilings for each shift determine the maximum actual supply. Moreover, given the different route profitability, there could be some cream skimming effects on some routes, with a territorial concentration of supply.

The actual supply of the service depends also on the possibility, given by some regional regulation, to pick up the client also outside the territory of the municipality that issued the licence. Apart from specific exceptions when there is an airport in the outskirts (normally in these cases the service is regulated by agreements among the interested municipalities), the survey showed that this possibility is provided in 10.4% and 19.4% of the municipalities for taxi and NCC, respectively.

5.2. Taxi fares

Fares for a 5 km trip on a working day (and working time) vary from 3.7 to 15.2 euro, and the average is 8 euro (Table 4). These data do not take into account the time charge that applies when the speed is lower than a certain threshold (normally 20 km/hour), for example at the traffic lights or in the case of traffic jam. The results of the survey show a high fare variance, especially in the fixed component and in particular for middle-size cities.

¹⁷ See Visco Comandini *et al.* (2004), Bergantino and Boitani (2003), Boeri (2006), *Il Sole 24 Ore*, July 4, 2006.

Table 4: Structure of urban taxi fare in the main Italian cities by city size (€).

Type of city	Mean	Minimum	Maximum	Difference between min. and max.	Coefficient of variation
<i>FIXED COMPONENT</i>					
Small cities	3.0	1.7	5.2	3.5	0.22
Middle-size cities	3.7	1.8	8.7	6.9	0.57
Big cities	2.7	2.3	3.3	0.9	0.12
Total	3.0	1.7	8.7	7.0	0.32
<i>VARIABLE COMPONENT (PER KM)</i>					
Small cities	1.0	0.1	1.6	1.5	0.28
Middle-size cities	0.9	0.7	1.3	0.6	0.23
Big cities	0.8	0.7	0.9	0.2	0.08
Total	1.0	0.1	1.6	1.5	0.27
<i>TOTAL COST FOR 5 KM TRIP</i>					
Small cities	8.0	3.7	11.0	7.4	0.18
Middle-size cities	8.4	5.9	15.2	9.3	0.33
Big cities	6.8	6.2	7.8	1.6	0.08
Total	8.0	3.7	15.2	11.6	0.21

Source: survey of Banca d'Italia on the supply and price of taxi service, 2007.

(1) Data refer to the end of 2006. Weekday urban fares in business hours.

Fares are lower in the big cities than elsewhere. A possible explanation of this difference is that it reflects the bigger market size and the presence of concentration poles of users, such as airports and main railway stations, that tend to reduce waiting time of customers and empty trips. The greater congestion of big cities also tends to increase the actual cost vis-à-vis the theoretical one more than in the other urban centres; for example, with the fare in force in Roma in 2007, a 5 minutes car stop (at the traffic lights or when the car slows down in the traffic jam, the time-fare applies) in a 5 km trip increases the total cost of about one third.

A meaningful comparison of service cost in the different cities should indeed take into account, together with the theoretical cost for a given trip, its significance, that is its closeness to the actual consumer's expenditure. The latter depends on congestion as well as the number of supplements and of fares different from the basic one, that reduce the fare transparency and leave room for operators' opportunistic behaviour. Among supplements, those that affect more the final price are the booking charges that are levied on customers who book taxis by telephone (included the dead-running cost) and the luggage charges. For example in Roma in 2007 the working day fare for a 5 km trip with a 5 minute time charge (for stops) and a luggage was € 8.99, more than 44% the basic one (€ 6.23).¹⁸ The survey of Banca d'Italia indicates an average of 4.5 supplements in the fare book.

In the determination of the final cost for the user it is also possible some interference of the taxi driver that can choose a trip longer than necessary, arriving at the place of the

¹⁸ In this computation we did not consider the value of the single fare unit, but simply the hypothetical time and km fares. At the beginning of 2008 in Roma the supplement for the first piece of luggage has been eliminated (see further on).

call with a taximeter already very high, or considering as a luggage a bag which is actually smaller than the regulated limit. In the survey done by Altroconsumo (2007) 44% of taxis arrived at the place where the booking was made more than 5 minutes earlier (the time charges apply) or later than agreed; in Firenze the amount indicated in the taximeter at destination varied from 2.74 to 9.64 euro. In 9% of the cases the initial charge was higher than expected¹⁹ or it has been increased by applying undue supplements. This type of effects could be limited by introducing receipts more detailed and with fiscal effect, that could increase transparency in the customer's relationship. The new taxi regulation of Roma, not yet approved in April 2009, provides that taxis should have a device connected to the taximeter that can, on request, issue a receipt with the trip details (fares, trip length, supplements applied, and so on). In Bologna the regulation sets a ceiling on the price indicated in the taximeter at the arrival of the taxi at the calling place (a similar ceiling was set by the new regulation of Roma). Another instrument to increase transparency and reduce the opportunistic behaviour of drivers is the introduction of flat rates. In 20.9% of municipalities there are flat rates, generally for the airport (for example in Roma and Milano); in Torino it has been introduced a flat rate inside the traffic-limited zone, in Napoli flat rates for several routes have been introduced.

The use of a two-part tariff is generalized for taxis, with higher fares both for the fixed and for the variable part in days and times of soft demand. In the smaller cities group it is higher both the average fixed part than the fare per km. The economic theory suggests the use of a two-part tariff (as an alternative to average cost pricing) for regulated natural monopolies, so as to allow the firm to recover high fixed costs. A part from the level of fixed costs another motivation for using a two part tariff for taxis is given by the presence of an opportunity cost for trips, because when the driver takes on a customer she gives up the chance of finding a more profitable one (by increasing search and waiting time costs). In this sense the adoption of a fare with a fixed part should provide incentives to avoid an opportunistic behaviour (both unlawfully or simply by operating only in areas where longer trips are requested, such as airports). Moreover the different level of the two fare components could reflect the aim to guarantee a similar average income to the operators in cities with different length/average distances. For the first 8 Italian cities there are no significant differences in the contribution of the two tariff components to the total cost (Figure 5).

On the whole, there is no evidence of a relationship between taxi supply and fare level (Figure 6). In more than 50% of the sample fare changes have been done at intervals at most of three years. This share includes mostly the cities of Centre and North of Italy, while in the South and in Islands fare adjustments tend to be done at larger time intervals. Fare adjustments are never decided on the basis of demand indicators (analysis of elasticity, of demand intensity in "soft" hours, and so on), but simply tend to follow closely the change of the Istat index of consumer prices; in some cases the specific input costs are also considered (car insurance, fuel cost, and so on).

Data on local cost differentials are not available. Some methodological indications can be drawn, with some caution, by a study by the Irish Commission for taxi regulation (2005), that for Ireland does not find significant territorial differences, except for fuel and insurance costs. Average employee labour incomes show instead some variance

¹⁹ This may happen, for example, if the driver inserts in the taximeter the night or Sunday starting fare, which is higher, when another fare applies.

around the national mean, that comes down considerably when considering industries separately.

For Italy, the ACI indicator of operating cost/km gives some aggregated information. For a diesel car²⁰ cost per km vary between 0,30 and 0,29 euro respectively for an annual run of 50,000 and 60,000 km. Fuel weighs 32.7% upon total variable costs and maintenance has a weight only marginally lower.

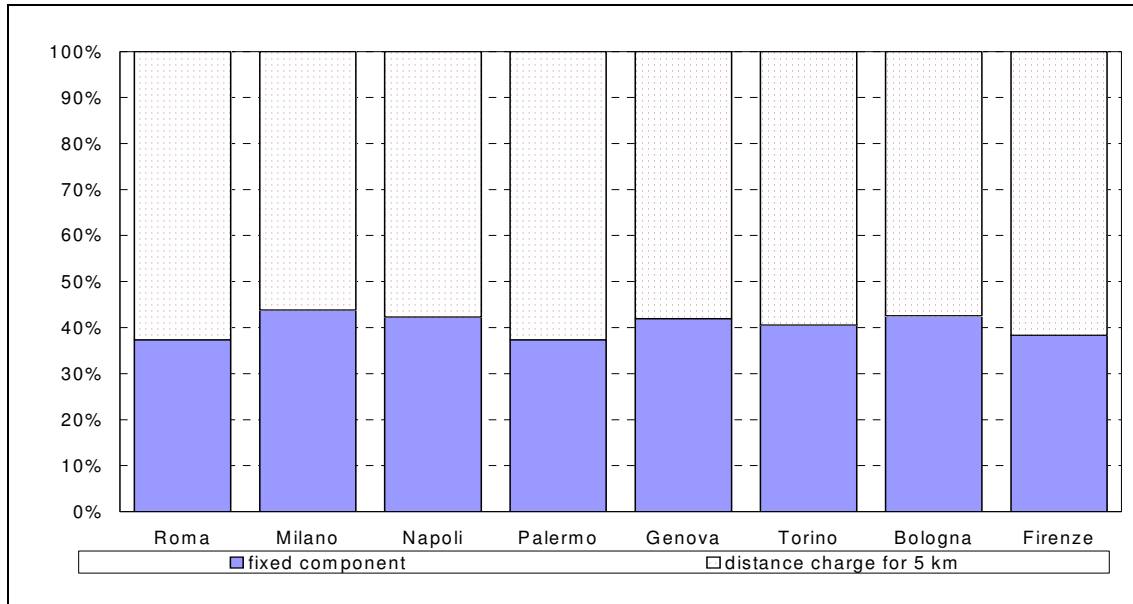


Figure 5: Contribution of the fixed component and of the distance charge to the total taxi cost for a urban journey length of 5 km in the main Italian cities (*percentages*).

Source: survey of Banca d'Italia on the supply and price of taxi service, 2007.

Note: Data refer to the end of 2006. Weekday urban fares in business hours.

Among fixed costs, which represent between 23.2% and 20.1% of total costs, car CDW insurance is the most significant one (58.7%). Another factor that influences the cost function is the use, established by the national regulation (with some specific exceptions introduced by the Bersani law), of the taxi in only one shift, that hampers the distribution of fixed costs on a higher number of km. Radio-dispatching services²¹ are estimated to cost about 170 euro per month by Asso Taxi (and normally they are compensated both by a specific fixed component of the fare and by the fact that taxi drivers set the taximeter on at the moment of the customer's call and until they reach their client²²). There are also additional costs (with respect to the ACI indicator) of CDW insurance premium, due to the higher frequency of accidents of taxis. According to ANIA data, in 2005 this frequency was on average 21.98% against 7.17% for the other cars²³. Service costs are also influenced by a partial refund of oil excises. Last, the

²⁰ Data refer to a car with a power of 1,500-2,000 and to March 2007.

²¹ According to the sector tax benchmarking study, the share of taxi drivers with a radio-dispatching service is about 32% in the low population density areas and about 90% and 78% respectively in the medium/high and high population density areas.

²² Moreover almost all radio-taxi firms are cooperatives whose members are the same taxi drivers that make use of the radio-taxi services and that participate to the radio-taxi company profits.

²³ Data are very variable across cities and oscillate (for taxis) from 5% in Ferrara to 61% in Caserta. For the big cities the taxi frequency of accidents varies from 20% to 25%.

taxi driver remuneration could be assumed to be about 50% of total costs. Therefore, the total cost/km could be around 0.6 euro.

The choice of the fare level (and in parallel of the licences number) by the regulator should take into account, beside cost components, also the level of the rents that a given regulation generates on the market. An indicator of these rents is given by the fact that, despite the fact that licences have been until now assigned free of charge (with the only important exception of Bologna), they have been sold at quite high prices on the secondary market (see § 5.1).

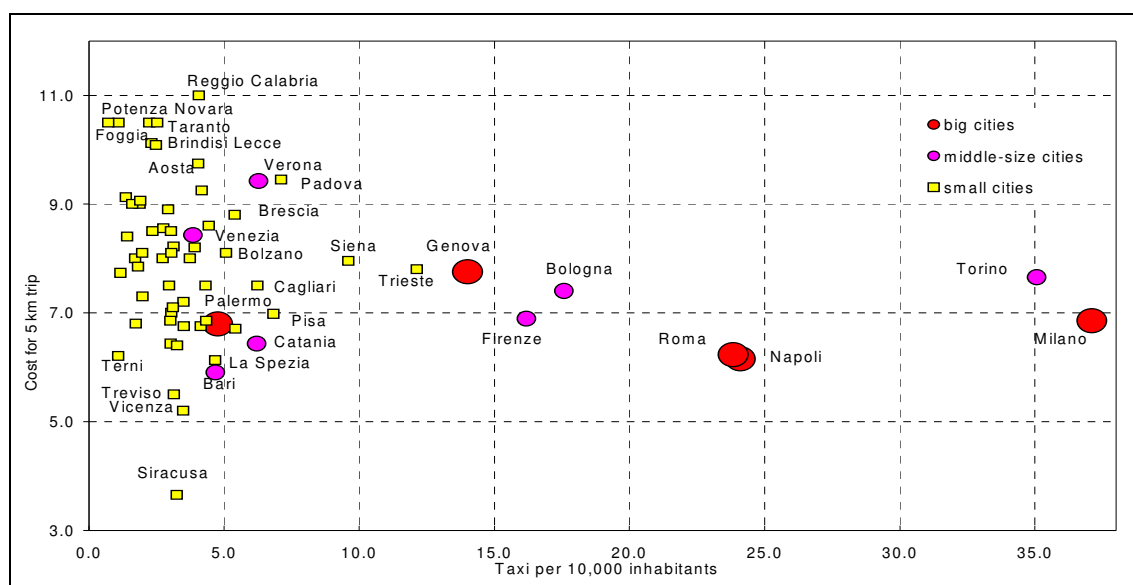


Figure 6: Number of taxi per 10,000 inhabitants and average cost for a urban trip of 5 km in the main Italian cities by city size.

Source: survey of Banca d'Italia on the supply and price of taxi service, 2007.

Note: Data refer to the end of 2006. Weekday urban fares in business hours. Data for the laguna of Venezia are not included.

The verification of the real returns of taxi drivers, that could be a relevant variable for the regulator, is difficult because taxi drivers are exempted from the release of a fiscal receipt. According to the data of Agenzia delle entrate, the average income declared by a taxi driver was 11,482 euro in 2004 (against 20,345 euro for a metalworker) and 13,800 in 2005. In Bologna the average income declared by the category in 2005 was 6,184 euro. These data seem to contrast with the high licences value on the secondary market. Moreover, the controls by the revenue authorities show a percentage of tax evaders in the sector of about 70%, having declared an average number of km lower of about 37% and a fuel cost lower of about 22% than the real one. Fiscal inspections have also found tax evasions in the licences sales that would amount, between 2000 and 2003, to 19.6 mln of euro in Lombardia and 18.8 mln in Lazio.²⁴

An interesting aspect of the phase of bargaining with the municipalities following the introduction of the Bersani law is that in most cases taxi drivers asked for a fare increase as a counterpart to accept new licences. In Firenze fares have increased by more than 20% (26% and 20.8% for the fixed component and the distance charge, respectively), in Roma at the beginning of 2008 the fare increased by 18% (with a supplement of 2 euro

²⁴ See *La Repubblica*, November 30, 2007, p. 3.

for departures from the Termini railway station and the suppression of the supplement for the first piece of luggage), in Milano in July 2007 there has been an increase of the distance charge of 12.6%, while the initial fixed charge has not been changed. Annual fare changes have been scheduled but subject to service quality evaluations. In Bologna in 2008 the fare increase has been about 8%; there is a discount of 3 euro (for a limited amount of trips per year) to women travelling alone between 10 p.m. and 6 a.m..

The coupling of licences increase and fare increase reflects several motivations (Aquilina, 2008). For the municipalities, it is a compromise to reduce the operators' resistance to the increase in the number of licences. For taxi drivers, instead, the rationality of this request depends on the elasticities of demand with respect to waiting time and price, as can be derived from the model presented in § 2. From (7), if $|\eta| < 1$ an increase in n , all other things being equal, determines a reduction in unit revenues (per operator). In this case taxi drivers could ask to the regulator a fare increase in order to try in this way to get returns back at least at the level prevailing before the increase in n . From (8) this happens if $|\eta| \leq 1$ (i.e. if demand is not very elastic with respect to price). In line with theoretical results, the municipality of Roma decided that fares have to be considered as "maximum fares" instead of fixed levels. This greater flexibility seems to be barely used by operators (AGSPL, 2007).

6. Some final remarks

In taxi and NCC markets demand depends not only on price but also on the quality of service. This last variable is related to general urban traffic and mobility policies and on waiting time. In a market where price and supply are fixed by a regulator, demand will adjust through changes in waiting time. This creates the possibility of multiple equilibria since demand depends on supply size through its dependence on waiting time. The regulator has a very difficult task, having to define a price and a supply level that at the same time are suitable to demand characteristics (and influence it through waiting time) and ensure an "acceptable" income to the operators in the market. This requires a continuous acquisition of information on demand and supply conditions, that was lacking in the Italian system.

Indeed the Italian regulation seems to derive more from some forms of capture of the regulator than from the presence of market failures. In local consulting bodies there is an over-representation of operators with respect to customers, with a frequent fare revision and a time-invariant supply, despite the fact that several demand indicators showed a growing dynamics. The large differences in supply, fares level and structure, and other operating rules across cities are difficult to explain on the basis of market conditions. The use of instruments of market knowledge by the regulator has been rare and sporadic, and service quality, also in terms of waiting time, has been deteriorating over time. The prohibition of creating "taxi companies" with multiple licences has no economic justification.

Instead of introducing a real deregulation, the Bersani law increased the number of options available to municipalities to increase supply, introducing also instruments of partial compensation of incumbents. The legislator's approach seems to have acknowledged the difficulties to implement more radical reforms in a single step, given the operators' bargaining power, especially in the big cities. The supply increase

implemented in some big cities has been obtained in exchange for fare increases that may have somehow discouraged the additional demand deriving from the reduction in waiting time.

The options chosen by municipalities among the ones available, the operators' reactions and the effect on local regulations and markets suggest some lines for intervention that, even in a non-liberalized market, may increase efficiency in the Italian market as well in other countries with highly regulated taxi and NCC services.

First, it seems appropriate the introduction of a "higher level" of regulation in the industry. The municipal regulator hardly ever used its main advantage, the possibility of knowing closely the market, while it has often been captured by local operators (this risk being its main disadvantage). The introduction at the national level of some norms that make compulsory the use of specific indicators of supply shortage and of need of fare adjustment and the opening of the market to companies that could own more than one licence could help to improve the situation.

A second action regards the integrated government of mobility at the local level, with the use of instruments such as the increase of reserved lanes for public transport and of limited traffic zones, road pricing, integrated transport fare systems, introduction of parking fees, and so on. The improvement of these context factors could increase significantly service efficiency and average speed and reduce waiting time.

A third useful instrument could be the introduction of additional mechanisms to increase service transparency with respect both to customers and to the regulator. Among the possible measures there are a drastic reduction of supplements and the delivery to the customer of a detailed receipt (with fiscal effect too).

Last, the regulator could also evaluate the use of compensation schemes (additional to the one already set by the Bersani law) for the annulment of licences value on the secondary market, that could be used as an instrument to overcome the opposition of incumbents to further supply increases.

The Italian experience shows that regulation itself can create rents that reinforce the influence of incumbents on regulators. The resulting market setting may solve, at least in part, some of the market failures, but at a very high cost in terms of consumers' welfare and total welfare and makes it very difficult to introduce significant changes.

Acknowledgements

I am grateful to Paolo Sestito, Magda Bianco, Silvia Giacomelli and many other colleagues of the Bank of Italy for useful comments and suggestions. The views expressed here are solely those of the author and do not necessarily reflect those of the Bank of Italy.

References

- ACI-Eurispes (2006) *Rapporto sulla qualità della mobilità nelle province italiane*, Roma.
- AGCM (1995) “Servizio di trasporto di persone mediante taxi”, *Bollettino*, 29: 61-65.
- AGCM (2004) “AS277 - Distorsioni della concorrenza nel mercato del servizio dei taxi”, *Bollettino*, 9: 63-67.
- Agenzia per il controllo e la qualità dei servizi pubblici locali del Comune di Roma (2004a) *Il settore taxi a Roma. Ipotesi di riforma*.
- Agenzia per il controllo e la qualità dei servizi pubblici locali del Comune di Roma (2004b) *Relazione annuale*.
- Agenzia per il controllo e la qualità dei servizi pubblici locali del Comune di Roma (2004c) *Terza indagine sulla qualità dei servizi pubblici nel Comune di Roma*.
- Agenzia per il controllo e la qualità dei servizi pubblici locali del Comune di Roma (2007) *Relazione annuale*.
- Altroconsumo (2007) “Lunga attesa per una corsa”, March.
- Aquilina, M. (2008) “Roma sbaglia sui taxi”, *www.lavoce.info*, February 26.
- Barrett, S.D. (2003) “Regulatory Capture, Property Rights and Taxi Deregulation: a Case Study”, *Economic Affairs*, 23, December, pp. 34-40.
- Basili, M. (2007) “E Roma aspetta ancora il taxi”, *www.lavoce.info*, October 24.
- Beesley, M. E. (1973) “Regulation of Taxis”, *The Economic Journal*, 83, 329, March: 150-72.
- Beesley, M.E. and Glaister, S. (1983) “Information for Regulating: the Case of Taxis”, *The Economic Journal*, 93, 371, September: 594-615.
- Bentivogli, C. and Calderini, M. (2007) “Il servizio di taxi in Italia: ragioni e contenuti di una riforma”, *Economia e politica industriale*, 2, July: 181-199.
- Bergantino, A. and Boitani, A. (2003) “Taxi: un mercato molto particolare”, *www.lavoce.info*, January 28.
- Bergantino, S., Billette de Villemeur, E. and Longobardi, E. (2007) “Il mercato dei taxi: fallimenti e regolamentazione”, in Marrelli, M. et al., *Servizi pubblici. Nuove tendenze nella regolamentazione, nella produzione e nel finanziamento*, Angeli, Milano.
- Boeri, T. (2006) “Un taxi chiamato desiderio”, *www.lavoce.info*, July 6.
- Bordignon, M. and Boitani, A. (2003) “Il mercato delle licenze dei taxi: una proposta operativa”, *www.lavoce.info*, February 6.
- Cairns, R.D. and Liston-Heyes, C. (1996) “Competition and Regulation in the Taxi Industry”, *Journal of Public Economics*, 59: 1-15.
- Censis (2006) *Il sistema delle fiere in Italia: tendenze evolutive e confronto con i principali competitor*, Roma.
- Commission for taxi regulation (2005) *National Review of Taxi, Hackney and Limousine Services*, Dublin.
- Daly, J. (2004) “Taxi Deregulation: Three Years on”, *Student Economic Review*, 18: 225-233.
- Douglas, G.W. (1972) “Price Regulation and Optimal Service Standards: The Taxicab Industry”, *Journal of Transport Economics and Policy*, 6(2): 116-127.
- Lam, W.H.K. and Bell, M.G.H. (2003) *Advanced Modelling for Transit Operations and Service Planning*, Elsevier, Amsterdam.
- Ministero dello sviluppo economico (2007) “Lo stato di attuazione della legge 248/2006”, *Mercato e consumatori*, 7(3), February, new series.
- Noam, E. (1982) “The Choice of Governmental Level in Regulation”, *Kyklos*, 35(2): 278-91.
- OECD (2007) *(De)regulation of the Taxi Industry*, Paris.
- Provincia di Parma (2003) “Analisi del fabbisogno di licenze taxi e autorizzazioni autovetture NCC in provincia di Parma”, mimeo.
- Regione Lombardia (2003) “Organizzazione del servizio taxi nel bacino aeroportuale lombardo e domanda effettiva (dati provvisori indagine origine/destinazione regionale)”, allegato C, DGR January 24, No 7/11948.
- Sta (2001) *Attività di monitoraggio della domanda e dell’offerta del servizio di taxi nel comune di Roma*, Roma.
- Stigler, G.J. (1971) “The Theory of Economic Regulation”, *The Bell Journal of Economics and Management Science*, 2(1): 3-21.
- Visco Comandini, V., Gori, S., and Violati, F. (2004) “Le licenze dei taxi: abolizione, regolazione o libero scambio dei diritti?”, *Mercato Concorrenza Regole*, 3, December: 515-48.