TRASPORTI, LOGISTICA E RETI DI IMPRESE

Competitività del sistema e ricadute sul territorio

a cura di
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ECONOMIA E POLITICA INDUSTRIALE

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INDICE

SCELTE DI TRASPORTO

POLITICA DEI TRASPORTI

TRASPORTI E AMBIENTE

PREFAZIONE

Questo volume raccoglie, in forma sintetica, le relazioni presentate alla XI Riunione Scientifica della Società Italiana di Economia dei Trasporti e della Logistica (SIET), tenutasi a Trieste il 15-18 giugno 2009. Ulteriori dettagli sulla conferenza, unitamente alle presentazioni informatiche dei relatori e ad alcune relazioni in forma più estesa, si possono trovare sul sito della Società: www.sietitalia.org.

Per la XI conferenza è stato deliberatamente scelto un tema ampio: "Trasporti, logistica e reti di imprese: competitività del sistema e ricadute sui territori locali". Si è voluto in questo modo dare spazio non solo a relatori che si occupano di aspetti specifici dei trasporti, ma anche a relatori specializzati in aree tematiche contigue quali l'economia industriale, l'economia regionale e del territorio, e la geografia economica. La conferenza, e il volume che ne raccoglie i contributi, offrono perciò una visione ricca e articolata del ruolo che i trasporti giocano come attività industriale in sé, nel promuovere lo sviluppo economico e nel determinare la forma e la qualità del territorio e dell'ambiente in cui si inseriscono.

L’INDUSTRIA DEL TRASPORTO

THE IMPACT OF CORPORATIZATION ON THE COST OF BUS TRANSIT SYSTEMS

di *Carlo Cambini*[1], *Massimo Filippini*[2], *Massimiliano Piacenza*[3] e *Davide Vannoni*[4]

1. Introduction

The relationship between ownership issues and managerial performance and their impact on firm's efficiency has received considerable attention in the economic debate, but less much so when specifically applied to regulated firms and to local public utilities.

Most studies focus on the ownership effect, i.e. on the performance comparison private and state-owned enterprises. Theoretical models suggest that the latter are more likely to exhibit excessively high costs, they are facing less binding financial constraints and could be more influenced by political parties (Shleifer, 1998; Tirole, 2001). The bulk of studies that empirically analyse the impact of ownership changes shows that privatization exerts positive effects on both firm's profitability and efficiency (Meggison, Netter, 2001).

Still, despite the huge wave of privatization started in the mid of eighties all around Europe, what we observe is that many public utilities are still under the control of central or local governments: at the end of 2000, through ownership or golden shares, the State was controlling more than 60% of privatized firms (Bortolotti, Faccio, 2008).

Notwithstanding the limited recourse to ownership change, many state-owned companies, especially within local public utilities, undertake

[1] DISPEA – Polytechnic of Torino and HERMES.
[2] Department of Economics – University of Lugano and ETH Zurich.
[3] Department of Economics and Public Finance "G. Prato" – University of Torino and HERMES.
[4] Department of Economics and Public Finance "G. Prato" – University of Torino and HERMES.

relevant transformations in their internal organization with the aim to improve productive performance. In fact, even in the case of publicly-provided services, firm's internal organization may change over time following a process which has been labelled *corporatization* by Shleifer and Vishny (1994). Corporatized companies represent an hybrid form between state-owned enterprises and private firms. As pointed out by Stiglitz (2000, p. 206): «Typically, before a government enterprise is privatised, it goes through the intermediate stage of corporatization. Most of the efficiency gains seem to occur in this stage, though there is controversy about why. Some argue that the freedom from government personnel, procurement, and budget restrictions is all that is required; under corporatization, effective incentive schemes can be put into place».

The present study contributes to the above literature by empirically investigating the effects of institutional changes in the internal organization of local utilities which continue to be owned (fully or through a majority share) by the State (i.e. local governments). Theoretical predictions we derive from the existing literature show that, as long as a firm changes the ownership status, a better alignment of incentives between managers and shareholders pushes the former to increase cost-reducing effort. But this effect still holds even for a special kind of institutional change, i.e. the corporatization of a state-owned firm. Corporatization, by reallocating control rights to managers, is a potentially effective instrument in providing incentives to improve performance and increase efficiency.

The impact of corporatization on firms' efficiency is tested exploiting the information on cost structure and institutional organization of local bus companies in Italy. To this purpose, we rely on a sample of 33 public transit systems observed over the period 1993-2002. Throughout this time span, all firms remain owned by a local government but some of them change their governance status from a fully public-owned company to a corporatized one, where managers have much more responsibility and residual control rights. For this reason we believe that Italian public transit systems represent an ideal natural experiment to evaluate the effect of corporatization, since no privatization process (fully or partial) has been carried out so far in this sector. Such an experiment allows us to address the question whether private ownership is the only solution to agency problems in the governance system, or whether a restructured governance system can positively influence the performance of these companies even if public ownership persists.

2. The corporatization process of local public services in Italy

In Italy local public services were typically carried on by local municipalities with in-house arrangements. This regime were established by the Giolitti Law in 1903 and lasted until the beginning of the nineties. In this time frame, the local services were managed directly by local municipalities and even when a distinct business was created (the so-called Azienda Municipalizzata), it was subjected to the same standard administrative and accounting rules provided for local governments. Law 142/90 reinforced the role of local municipalities and gave birth to the "special company" (Azienda Speciale), a particular type of firm controlled by the local government but with more budgetary and operational autonomy.

The main idea of this reform was to shelter the management of the firm from the influence of policy makers. But still the process was not complete, since local utilities were by large directly run by local governments. Therefore, the Italian government introduced a new and much more powerful reform in 1997 (law 127/1997), with the aim to provide incentives for local municipalities to transform the special companies into standard limited responsibility enterprises. Then law 448/2001 established that, by the end of June 2003, all special companies had to be reorganized as standard limited responsibility companies, but subsequent reforms postponed such a deadline.

3. Empirical analysis

Empirical studies on the cost structure of bus companies traditionally assume total cost as a function of output, price of inputs and some hedonic variables, such as network length, the number of stops, and average commercial speed, that capture some heterogeneity in the output and in the different service areas. According to the discussion above, another group of factors likely to influence the production costs concerns the internal organization of bus companies, i.e., the status of municipal company, autonomous company, or SpA corporation. In this study, relying on the same empirical approach followed by Filippini and Prioni (2003) and Roy and Yvrande-Billon (2007) to assess the effects of ownership structure, we choose to investigate the impact of changes in the organizational form on total cost by including two binary indicators for the governance type in the model specification:

$$\ln\frac{C_{it}}{p_{E_{it}}} = \alpha_0 + \alpha_y \ln y_{it} + \alpha_n \ln n_{it} + \alpha_s \ln s_{it} + \sum_{r=L,K} \alpha_r \ln\frac{p_{r_{it}}}{p_{E_{it}}} + \sum_{\substack{l=y,n,s \\ m=y,n,s}} \frac{1}{2}\alpha_{lm} \ln l_{it} \ln m_{it} + \sum_{\substack{r=L,K \\ q=L,K}} \frac{1}{2}\alpha_{rq} \ln\frac{p_{r_{it}}}{p_{E_{it}}} \ln\frac{p_{q_{it}}}{p_{E_{it}}}$$

$$+ \sum_{\substack{l=y,n,s \\ r=L,K}} \alpha_{lr} \ln l_{it} \ln\frac{p_{r_{it}}}{p_{E_{it}}} + \alpha_{SPA} DSPA_{it} + \alpha_{AU} DAU_{it} + \alpha_{MIX} DMIX_{it} + \alpha_{REG} DREG_{it} + \alpha_T T_t + \varepsilon_{it}$$

[1]

where C is the annual total production cost and y is the output; n and s represent network size and average commercial speed, respectively; p_K, p_E and p_L are the prices of capital, energy and labor inputs[5]. In order to test for the effects of the governance form on the cost we introduce in the model the following dummy variables: DSPA, which is equal to 1 for bus companies that are corporations and 0 for the other organizational types, and DAU, which is equal to 1 for firms that are autonomous companies and 0 for the other governance forms. DREG is a dummy which distinguishes the regulatory regime for subsidies (i.e., fixed-price = 1 versus cost-plus contracts = 0) applied to each bus company. DMIX is a dummy variable that distinguishes specialized urban bus companies from those operating also in intercity areas (mixed service =1). Finally, the trend variable T reflects the effects on costs due to technical progress.

The dataset is an unbalanced panel of 33 bus transit companies over the 1993-2002 time period, for a total of 261 observations. Preliminary descriptive statistics show that average unitary cost (total cost divided by supplied seat-kilometers) is the highest for the group of municipal companies, the lowest for SpA corporations, while intermediate values are exhibited by the autonomous company category. It is precisely such a link between cost performance and organizational form that we intend to test in a context of a multivariate regression analysis.

We have performed several tests and tried alternative estimation procedures. Here we present the results obtained from our preferred specification, i.e., a 'true' random effect frontier model (Greene, 2005), where the residual ε_{it} is allowed to incorporate a standard symmetric noise (v_{it}), a random firm-specific effect (α_i), and a one-sided stochastic term (u_{it}) aimed at capturing the inefficiency in the production process, i.e., the presence of companies deviating from the benchmark behavior of cost minimization. We assume that uit follows a half-normal distribution $-u_{it} \sim$

[5] The variables included in the cost function specification were computed following Cambini et al. (2007) and Piacenza (2006).

$N^{+}(0,\sigma u^{2})$ – and the estimates of frontier coefficients are computed by simulated maximum likelihood.

Table 1 presents parameter estimates and standard errors of translog cost frontier model [1]. The mean cost inefficiency is around 0.06, implying that observed costs, on average, are 6% over the minimum frontier level. The estimated coefficients for labor price (0.78) and capital price (0.21) reflect the shares of total costs attributed to labor and capital at the mean point of production. Output elasticity is 0.84, which means that a 10% increase in the supplied seat-kilometers will increase total cost only by 8.4%, while the cost elasticity with respect to network length is lower (0.11), even if significant. Overall, economies of scale (ES = 1.05) and of network density (ED = 1.18)[6] estimated for the average bus operator highlight that medium-sized operators do not operate at the optimal density of the network and at the optimal scale, suggesting that a more intensive usage of the existing network would decrease the cost per seat-kilometer, and that for adjacent bus companies end-to-end mergers could be promoted. The coefficient of DREG suggests that operators under incentive regulation have 4% lower costs than bus companies under cost-plus contracts. The cost elasticity for the commercial speed s is negative and significant, implying that a 10% increase in speed is effective in reducing operating cost considerably (-3%). Finally, the negative and significant coefficient for the dummy variable DMIX highlights that mixed companies, by being active in both urban and intercity areas, enjoy scope economies between the two types of bus service.

Most importantly for our aim, the negative coefficients estimated for DSPA and DAU show that bus companies that are more independent from local government influence operate more efficiently with respect to bus companies directly managed by the public administration. Furthermore, as expected, the transformation of municipal companies into SpA corporations has a stronger impact in terms of cost reduction (-8%) than a transformation in an autonomous company (-3%); this is probably due to the higher degree of freedom from the typical restrictions imposed on government agencies as far as personnel hiring and promotion, procurement and long-term investment budgetary operations are concerned.

[6] Scale and density economies are computed as $ES = \frac{1}{\frac{\partial \ln C}{\partial \ln y} + \frac{\partial \ln C}{\partial \ln n}}$ and $ED = \frac{1}{\frac{\partial \ln C}{\partial \ln y}}$.