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IS EFFICIENCY IN TRANSPORT RELATED EXPENDITURES CAPITALISED IN HOUSING MARKET QUOTATIONS? THE CASE OF ITALIAN MUNICIPALITIES

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SOMMARIO

This article analyses the relative efficiency of Italian municipalities using panel data (2001 - 2007), looking also into its main determinants and to its impact on the local housing market quoatations. To that end a unique longitudinal dataset will be constructed including financial and qualitative variables. Our discussion will focus on one particular area of public goods provision, namely transport related expenses. The analysis is performed in two stages: first, we use Data Envelopment Analysis (DEA) to calculate an index of local municipalities efficiency, in particular the methodology proposed by Simar and Wilson [1998, 2000] will be used to estimate a "bias corrected" measure of efficiency; second, a parametric approach will be used to evaluate the determinants of efficiency and its impact of the housing market quotations.

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1 Introduction

Information about the main sources of (in)efficiency and their relation with observable indicators like the housing market quotations are important, since they can provide useful insights for local policy-makers and for defining accountability measures by both higher levels of governments and residents (voters).

According to the recent theoretical literature in the field of fiscal federalism [Besley and Case, 1995, Besley and Smart, 2007, Bordignon et al., 2004, Hindriks and Lockwood, 2009] a more decentralised system can stimulate higher efficiency in the provision of local services only if it is able to stimulate the electoral accountability of local politicians[3]. This goal can be achieved directly when the electorate can judge the performance the local government observing indicators which measure, in a consistent way across time and across local authorities, the quality of local services. This is the case of the Comprehensive Performance Assessment (CPA) introduced by the UK government between 2002 and 2008 in order to evaluate the current performance of English local authorities in the provision of local services. CPA was finalised to produce league tables of local authorities that where widely disseminated in the media thereby providing a direct impact on the probability of re-election of incumbents local government as discussed by Revelli [2008]. In the absence of such performance indicators the electoral accountability of local politicians can be stimulated indirectly by yardstick competition among local governments, a form of competition that occurs when voters can compare tax policies and level of public good provision that have been adopted by officials in other regions with those offerend in their own jurisdiction and then use their ballots as votes on the performance of their incumbents.

[3]Electoral accountability is defined in Seabright's 1996 seminal paper [Seabright, 1996] in terms of the probability that welfare levels of a given jurisdiction determine the election of the government. Recently, Lockwood [2006] proposed to characterise this concept more precisely, either by the degree to which institutions allow the government to divert rents or by the degree to which institutions allow special interest groups to distort government decision-making by lobbying.

The problem is that yardstick competition can work properly, stimulating electoral accountability thereby boosting efficiency of local governments, only if the electorate has a good perception of the efficiency by which local services are provided in his own municipality compared with those offered in the neighbouring authorities. Therefore, in the absence of performance indicators widely disseminated in the media it is important to know if other indicators easily observable by the local electorate, like for example the housing market quotations, the level of the property tax, the level of the budget deficit and so forth, are correlated with the level of efficiency in the provision of local services thereby providing an observable metric of efficiency that the electorate can use.

In this paper we address this issue in relation to the local transport service provided by the Italian municipalities (only provincial capital cities) in order to understand at want extent efficiency in the provision of this local services is capitalised the quotations of the local housing market. Essentially, this paper aims first at assessing the extent of possible improvements relative to the "best practice" frontier in the delivery of local transport services by Italian provincial capital cities using Data Envelopment Analysis, and subsequently it aims at evaluating to what extent municipals' performance is reflected into the quotations of the local housing market using a more standard parametric approach.

This analysis is particularly important in the actual Italian political and economic contest, since Italy is moving towards a more decentralised system of government without knowing the potential consequences of these reforms on the efficiency in the provision of local services. Therefore, especially in the Italian contest, where local authorities are not subject to any official performance assessment, it is important to study if there are indicators that reflect the efficiency of local governments in the delivery of public services and that can be easily understood by the electorate in order to use them to set off the mechanisms that allow to obtain the benefits of a more decentralised system as suggested by the recent theoretical findings.

Our main results are as follows ....

The rest of the paper is organised as follows ....

2 Efficiency of local government and housing market

3 The Construction of the Efficiency Index

We will measure efficiency by data envelopment analysis (DEA hereafter). To that end, each provincial capital will be treated as a decision-making unit that provides local services under the behavioural assumption that each of them operates in order to minimise the level of inputs given the level of output (input approach), or alternatively, that operates in order to maximise the output given the inputs (output approach). According to these simplified assumptions, therefore, we assume that the aggregated output of the local authorities is the result of the following production function:

$$y_{it} = f(\mathbf{x}_{it};\beta)h(\mathbf{z}_{it};\gamma)exp(v_{it}+u_i) \quad i = 1,2,...,N \text{ and } t = 1,2,...,T. \tag{1}$$

where N is the number of local authorities, T the number of years, y_{it} is the aggregated output, $\mathbf{x}_{it}$ is a $(L \times 1)$ vector of inputs, $\mathbf{z}_{it}$ is a $(M \times 1)$ vector of environmental variables, β a vector of technology parameters, γ is the vector of coefficients on the environmental variables. For simplicity, and with little loss of generality, we assume separability between $f(.)$, which describes the technology, and $h(.)$ which represents the way in which the environment affect the output. Since we are estimating a "frontier" production function, the error term has two components: the idiosyncratic error $v_{it} \sim i.i.d.(0, \sigma_v^2)$, which accounts for the statistical noise in the production function, and the inefficiency error component u_i, which is assumed to satisfy the restriction $u_i \leqslant 0$ and can be associated to the managerial inefficiency specific to each local authority, that can not be observed directly but only inferred as a residual.

In this case, since we are conducting a short term analysis, it is possible to assume that u_i is time invariant.

Given the previous assumptions about the behaviour of the local authorities, the first step is the estimation of the "gross" level of efficiency $e_{it} = \frac{y_{it}}{f(x_{it},\beta)}$ that corresponds to the distance between the actual level of output attained by the local authority i in the year t and the maximum output attainable given the inputs employed in the production. DEA is a non-parametric estimator of e_{it}, no assumptions about the shape of $f(.)$ are necessary, and the convexity of the production set is the only restriction that needs to be imposed. Moreover DEA is a powerful estimator in case of multidimensional production frontier since allows us to avoid contrived forms of output aggregation. On the other hand, a large number of observations is an important prerequisite for a meaningful analysis in case of a multidimensional production frontier. This problem will be discussed again later on.

In the case of the input approach, let e_{it}^{DEA} be the solution of the following linear program:[4]

$$\min_{\phi,\lambda} \phi \quad s.t. \;\; \phi \mathbf{x_{it}} \geqslant \mathbf{X_t}\lambda; \;\; \mathbf{Y_t}\lambda \geqslant \mathbf{y_{it}}; \;\; \lambda \geqslant 0; \;\; \iota'\lambda = 1 \tag{2}$$

Then e_{it}^{DEA} is the efficiency score for the council i in period t. It satisfies: $e_{it}^{DEA} \in (0,1]$, with a value of 1 indicating a point on the frontier and hence a technically efficient council, according to Debreu [1951], Farrell [1957] definition. The linear program in (2) is usually solved by using a pooled approach where only one production frontier is estimated and each municipality is compared also with itself in another year. In this way it is possible to use all the $N \times T$ observations.

Consistency is the most important property of an estimator, that is an estimator of an unknown parameter is consistent when it converges to the true

[4] In (2) $\mathbf{x_{it}}$ is the matrix of input of council i at time t, $\mathbf{X_t}$ is the matrix of inputs of all councils, $\mathbf{Y_t}$ is the matrix of outputs of all councils, λ is a vector of optimal weights attached to the peers of local government i; ι is a vector of ones, the last constraint is important for imposing variable returns to scale.

value of that parameter as the sample size increases. There is no reason to use an inconsistent estimator since in that case increasing the amount of data would not allow of getting close to the true value that one wants to estimate. In nonparametric statistics, it is quite difficult to prove convergence of an estimator as well as to obtain its rate of convergence. Recently, however, it has been found that e_{it}^{DEA}, as a non-parametric estimator of Debreu-Farrell measure of technical efficiency, is biased upwards since it does not converge toward e_{it}. In particular, Kneip et al. [1998] showed that:

$$e_{it}^{DEA} = e_{it} + O_p(n^{-\frac{2}{l+q+1}}) \tag{3}$$

where n is the number of observed production plans, l is the number of inputs, and q is the number of outputs in DEA. Which means, with some abuse of language, that as we increase the sample size DEA converges toward the true value of efficiency plus something that corresponds to the bias, and that the rate of convergence is $n^{\frac{2}{l+q+1}}$. Hence it appears that the higher the number of the inputs and/or the outputs, the slower the convergence rate, this means that when $l+q$ is grater than three, like in this case, our estimates can be very imprecise unless a very large quantity of data is also available since the rate of convergence is slower than the standard $\sqrt{n}$.

In this study, although more than 500 observations are available, the bootstrap procedure developed by Simar and Wilson [1998, 2000] will be used to estimate a "bias corrected" measure of efficiency ($\widetilde{e}_{it}^{DEA}$) along with its interval of confidence at the 95% level of significance in order to study the statistical properties of the efficiency estimates. In the second stage the impact of CPA and other exogenous environmental variables on local government's efficiency is evaluated through the estimation of the following empirical model derived directly from the base model in (1):

$$\frac{y_{it}}{f(\mathbf{x}_{it}, \beta)} = h(\mathbf{z}_{it}; \gamma) exp(v_{it} + u_i) \tag{4}$$

After replacing $\frac{y_{it}}{f(\mathbf{x}_{it},\beta)}$ with the bias corrected DEA measure of efficiency $\widetilde{e}_{it}^{DEA}$, and assuming for simplicity a Cobb-Douglas functional form for $h(.)$ the final empirical model to estimate the impact of CPA and other environmental variables becomes:

$$\widetilde{e}_{it}^{DEA} = \prod_{m=1}^{M} z_{itm}^{\gamma_m} \times \exp\left(v_{it} + u_{it}\right) \tag{5}$$

where M is the number of environmental variables.

4 The Data

The choice of the variables apt to measure the output of the local government's activity is, in general, a very difficult exercise. It is very important to stress the we had to do some simplifications in order to deal with the usual tread-off between accuracy and the curse of dimensionality that undermine the validity of DEA as a non-parametric estimator of efficiency.

Considering the particular nature of the decision making units, the basic idea is to measure not only the "quantity" but also the "quality" of the output achieved by municipalities in the transport sector. To that end a subset of transport indicators (see Table 1) published by ISTAT [2010] have been chosen considering that they are broadly accepted by the local governments as measures of output quality and are fully comparable both across time and between local authorities.

As far as the input side is concerned the choice of the right variables is much less problematic: data from municipal budget accounts, published online by the Ministry of the Interior, have been used to define the inputs in terms of current and capital expenditure (real euro per capita) related to the transport service.

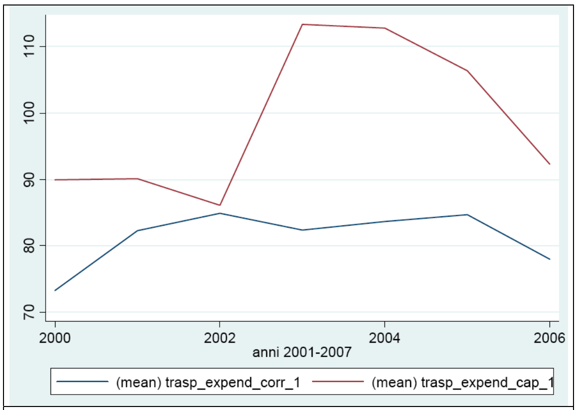
Table 1 reports some descriptive statistics of our input and output variables, it is important to stress that they do not include the two following groups of municipalities: Roma, Milano, Torino, Genova, Napoli, and Catania excluded

Table 1: Output and input variables, descriptive statistics without outliers.

Variables	Mean	Standard deviation		
		overall	*between*	*within*
OUTPUT				
Posti km per 1000 abitanti	1.99	1.01	1.02	0.14
n. di incidenti per mille abitanti	6.56	2.16	2.13	0.90
Km rete per 100 Km2 di sup. comunale	151	86	88	10
Vetture per 10000 abitanti	6.55	2.83	2.92	0.68
n. di fermate per km2 di sup. comunale	4.26	3.65	3.75	0.18
INPUT				
Spesa settore trasporti corrente pro capite	78.88	34.67	31.98	15.38
Spesa settore trasporti c/cap. pro capite	98.93	90.51	73.77	69.92
Popolazione residente	91159	80736	84625	2137

because differently from most of the other provincial capitals provide the underground services; 2) Aosta, Bari, Bergamo, Cagliari, Cosenza, Firenze, La Spezia, Messina, Pescara Rimini, Siena, Trapani, Trento, Trieste and Venezia excluded because they are outliers in one or more output and input variables.

Figure 1: Current and Capital expenditure related to the transport sector, average across municipalities



Red = cpital expenditure; Blue = Current expenditure. Euro per capita

Figure 1 reports the path followed by the current and the capital expenditure averaged across municipalities between 2000 and 2006, the maximum time span of our dataset. It is important to note that capital expenditure exhibits a huge increase after 2002 followed by a sudden decrease in the sub-

sequent years. This particular path cast some doubts about the inclusions of capital expenditure among the inputs, therefore efficiency indices will be also computed excluding the capital expenditure from the production function.

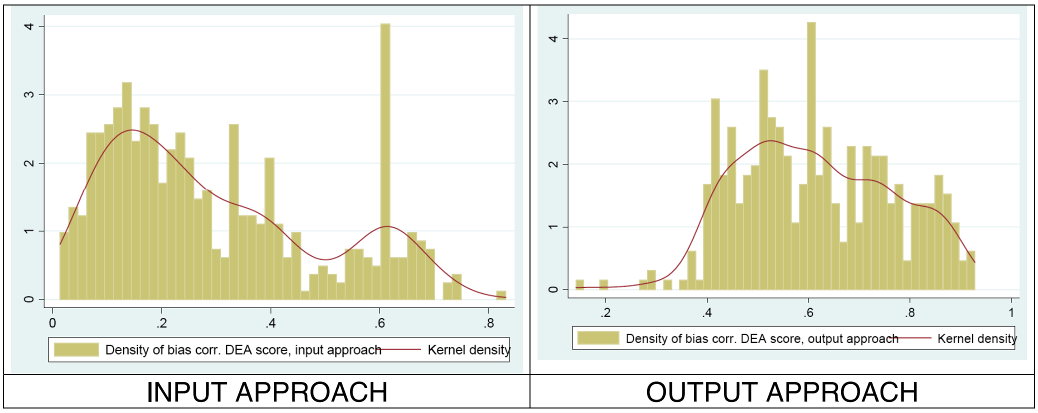
5 Efficiency Indices in the Transport Sector

Using a sample made up of 534 production plans including 90 provincial capitals over on average time span of six years, DEA bias-corrected efficiency indices along with their 95% interval of confidence have been computed following the bootstrap methodology discussed above. Subsequently a sample of bias corrected measure of efficiency will be constructed using only those estimates considered statistically significant according to the following criteria (that are required to hold simultaneously): 1) the mean-square error of the unbiased DEA estimator should be smaller than the mean-square error of the biased estimator of efficiency; 2) each bias corrected measure of efficiency should be found in the same quartile considering the distribution of the lower and the upper bound of the 95% interval of confidence constructed around our bias corrected estimates of efficiency.

Table 2: Sample of statistically significant bias corrected indices of efficiency

Years	Total observations $\tilde{e}_{it}^{DEA}$	Input Approach		Output Approach	
		Statist. significant	%	Statist. significant	%
2000	55	53	96	45	81
2001	78	71	91	58	74
2002	79	77	97	62	78
2003	75	71	94	57	76
2004	82	75	91	67	81
2005	79	74	93	59	74
2006	86	79	91	70	81
Total	534	500	93	418	78

Figure 2: Density of bias corrected DEA indices of efficiency (input and output approach, only statistically significant observations.



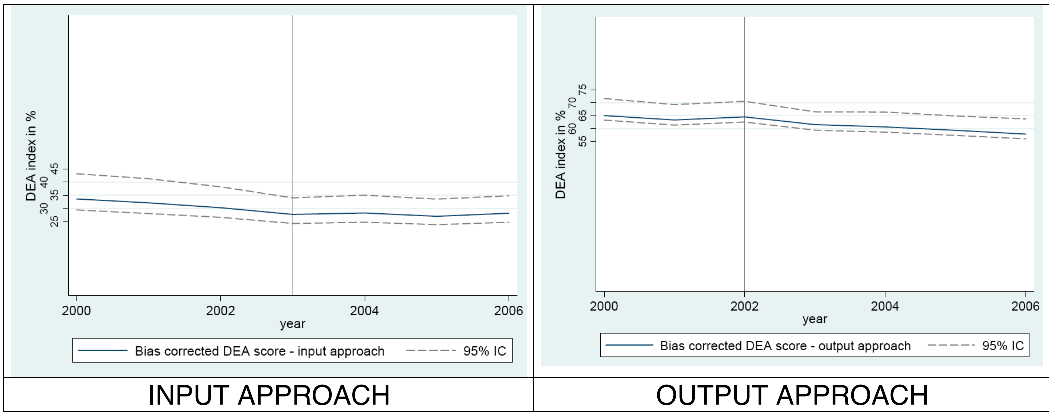
As reported in Table 3 we started with 534 bias corrected indices of efficiency, then 93% of total indices score resulted statistically significant in case of input approach, and 78% of total indices score resulted statistically significant in case of output approach.

Figure 2 report the density of the bias corrected indices of efficiency obtained using the input and the output approach. Although the two distributions looks very different the Spearman correlation between the two rankings of municipalities is 0.84.

Figure 3 and 4 report the DEA score (both in case of input and output approach) considering only the statistically significant DEA indices. In Figure 3 it is possible to register a decreasing trend in efficiency both in case of input and output approach. In Figure 4, where regions are ordered form north to south, only in case of the output approach it is possible to note an outstanding difference between the north and the south of the country, that respectively exhibit the highest and lowest levels of efficiency.

A final issue is the degree to which other aspects related to the quality of the urban transport service, which have not been included in the production function because can not be interpreted as outputs, affects the efficiency scores. This is important because the ability to provided the transport service

Figure 3: Average DEA scores (input and output approach) across years, only statistically significant indices, year 2001-2006.



efficiently may be subject to external constraints like the numerousness of the resident population, the passengers demand, the density of vehicles, the presence of pedestrian precinct etc. Therefore this group of variables can be used to explain, at least partially, why some municipality are more efficient than others.

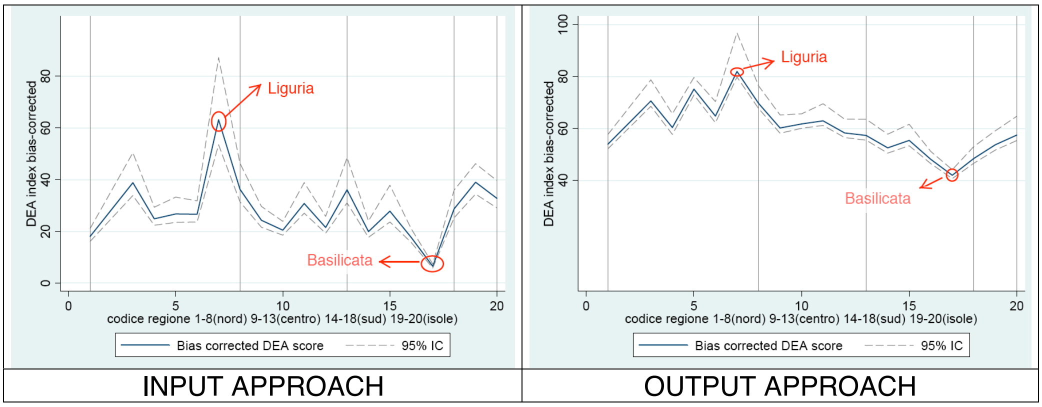
This issue can be addressed estimating the followig log-linearised version of the model reported in (5):

$$\log\left(\widetilde{e}_{it}^{DEA} \times 100\right) = \sum_{m=1}^{M} \gamma_m \log z_{itm} + \underbrace{\eta_t}_{year\ dummies} + u_i + v_{it} \qquad (6)$$

that corresponds to a linear FE-panel data model where η_t corresponds to a set of year dummies, then dummies specific to each municipality can be used to control for the impact of the unobserved managerial efficiency "u_i". The simplest consistent estimator of the model in (6) is the "*within the group*" that eliminates u_i form the model thereby avoiding any cumbersome assumption about it.

Point estimates for the parameters of the model in (6) are reported in Table 3: the first two columns display the results in relation to efficiency indices obtained excluding the capital expenditure in the production function,

Figure 4: Average DEA scores (input and output approach) across geographical regions, only statistically significant indices.



whereas the last two columns report the estimates related to efficiency indices computed using a production function that include both current and capital budget expenditure. Efficiency in the delivery of the local transport service seems to be positively affected by the following variables: the number of motorcycles, the square metres of pedestrian precinct, the number of passengers and the council run by local parties. Instead the population, as a symptom of negative return to scale, and a council run by centre-right parties exhibit a negative correlation with efficiency.

6 The Impact of Efficiency on the Housing Market Quotation

The final issue addressed in the paper is the evaluation of the impact that the level of efficiency in the provision of local transport services might exert on the quotations of the housing market. The first step in this analysis will be the estimation of the following FE panel data model:

$$y_{it} = \beta x_{it} + \eta_t + u_i + v_{it} \tag{7}$$

Table 3: Point estimate of the impact of the environmental variables on efficiency in the provision of local transport services.

	only current expnediture		current and capital expenditure	
	input approach	*output approach*	*input approach*	*output approach*
Motocicli per 1.000 abitanti	38.10	23.80	21.40	44.60
	*(12.04)****	*(9.15)***	*(25.82)*	*(12.15)****
Disponibilità di aree pedonali	0.50	0.13	1.17	0.93
m2 per 10 abitanti	*(0.24)***	*(0.25)*	*(0.76)*	*(0.40)***
passeggeri annui trasportati dai mezzi di trasporto pubblico	-2.64	9.27	-1.69	5.13
per abitante	*(4.67)*	*(3.87)***	*(8.13)*	*(4.75)*
giunta retta da liste civiche	-0.30	-0.55	-1.67	4.44
	(3.73)	*(0.82)*	*(11.26)*	*(1.83)***
giunta retta da partiti del centro destra	-1.54	-1.27	-3.46	-2.26
	(1.55)	*(0.93)*	*(2.34)*	*(1.08)***
popolazione residente	-19.50	-71.30	1.50	-2.07
	(38.18)	*(29.83)***	*(104.2)*	*(47.07)*
Stalli parcheggi scambio con trasporto pubblico	0.12	0.46	-0.36	-0.36
per 100 autovetture circolanti	*(0.29)*	*(0.30)*	*(1.14)*	*(0.42)*
Stalli sosta a pagamento su strada	-0.09	-1.02	-0.17	-0.82
per 1000 autovetture circolanti	*(0.48)*	*(0.74)*	*(1.59)*	*(0.59)*
autovetture per 1.000 abitanti	-21.20	-46.10	-4.71	-15.10
	(39.64)	*(27.90)*	*(9.55)*	*(4.78)*
Veicoli per km2 di superficie comunale	-24.90	11.80	29.70	-14.50
	(44.12)	*(37.79)*	*(116.0)*	*(49.33)*
Densità zone traffico limitato (ZTL),	0.06	-0.01	-1.28	-0.59
km2 per km2 di superfici e comunale	*(0.45)*	*(0.40)*	*(1.63)*	*(0.50)*
Densità di piste ciclabili,	-0.30	0.17	0.40	0.24
km per km2 di superficie comunale	*(0.30)*	*(0.18)*	*(0.86)*	*(0.44)*
Approvazione del Piano Urbano del Traffico (PUT)	-7.32	-2.69	-9.38	-4.07
	(4.55)	*(2.16)*	*(6.68)*	*(4.63)*
Total observations	457	426	447	373
Number of municipalities	90	90	89	89
R-squared	0.16	0.26	0.05	0.19
% of variance due to u_i (managerial efficiency)	97%	99%	85%	95%

*Robust standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%*
Coefficients' estimates can be interpreted in terms of elasticity

where the dependent variable will correspond to the housing market quotations, expressed in euros per square meter, of estates in normal conditions placed in three different zones: city centre, semi-central zone and suburban zone. Then in each zone four types of properties are considered: residential homes, shops, car parks, offices, and warehouses. Finally x_{it} will correspond to DEA efficiency indices related to the municipal transport service, η_t is a set of year dummies, u_i is a set of municipal dummies, and finally v_{it} is the $i.i.d.$ random shock. Similarly to the model in (6) also the model in (7) can be estimated using the "within the group" estimator in order to avoid particular assumptions bout u_i, a variable that now captures the unobserved heterogeneity in the housing market quotations or factors specific to each municipality and fixed over time that affect the properties' value.

Tables 4, 5, and 6 report the point estimates for the parameter β respec-

Table 4: Point estimates of the impact of efficiency on the housing market quotations: city centre

approach	c/cap.	controls	Residenziale	Terziario	Parcheggi	Commerciale	Produttivo
input	**no**	**no**	1.29 *(2.84)*	2.85 *(3.01)*	1.50 *(3.87)*	-5.93 *(5.35)*	-0.27 *(2.03)*
output	**no**	**no**	1.91 *(4.33)*	4.72 *(5.04)*	0.43 *(8.11)*	-1.62 *(9.04)*	-1.70 *(3.31)*
input	**no**	**si**	-0.54 *(3.01)*	3.56 *(3.15)*	1.23 *(3.91)*	-4.81 *(5.62)*	-1.54 *(2.18)*
output	**no**	**si**	2.57 *(4.79)*	4.03 *(5.91)*	2.64 *(7.92)*	-1.37 *(9.73)*	-0.96 *(3.74)*
input	**si**	**no**	2.06 *(1.14)**	2.60 *(1.18)***	0.83 *(0.92)*	-0.54 *(1.78)*	0.13 *(0.62)*
output	**si**	**no**	2.80 *(5.08)*	4.36 *(4.14)*	-1.02 *(3.94)*	-6.01 *(8.52)*	-1.53 *(2.19)*
input	**si**	**si**	1.35 *(1.05)*	2.06 *(0.89)***	1.28 *(0.91)*	-0.37 *(1.68)*	-0.02 *(0.46)*
output	**si**	**si**	0.88 *(4.19)*	3.17 *(3.96)*	0.91 *(3.32)*	-3.69 *(8.04)*	-1.45 *(1.74)*

Robust standard errors in brackets
** significant at 10%; ** significant at 5%; *** significant at 1%*
Coefficients' estimates can be interpreted in terms of euros per 1% increase in efficiency

tively for the four types of properties in the central, semi-sentral and suburban zone.

All tables reports empirical evidence in favour of the hypothesis that housing market quotations are positively affected by efficiency in the provision of the local transport services. In particular this result is quite robust in relation to offices and residential homes. Then there seems to be a weaker impact on the quotations of shops, that exhibit coefficients' estimates statistically different from zero only in the suburban area, and on the quotations of parks whose coefficients are significant only in case of semi-central zones. There seems to be no correlations, instead, between efficiency and the quotations of warehouses whose coefficients are never statistically significant. In general the correlation between efficiency and housing market quotations seems to become stronger as you move away form the city centre towards the suburban area. Moreover some differences between the two configurations of the production functions - with and without the capital expenditure - can be reported only in relation to the central and semi-central zones for houses, offices, and parks; and in correspondence of the suburban are for shops. Finally, the inclusion of

Table 5: Point estimates of the impact of efficiency on the housing market quotations: semi-central zone

approach	c/cap.	controls	Residenziale	Terziario	Parcheggi	Commerciale	Produttivo
input	**no**	**no**	1.45 *(1.88)*	3.65 *(2.07)**	2.53 *(2.27)*	0.35 *(2.19)*	1.29 *(1.77)*
output	**no**	**no**	0.31 *(3.09)*	5.11 *(3.20)*	6.21 *(4.07)*	0.78 *(4.02)*	-0.37 *(2.91)*
input	**no**	**si**	0.29 *(2.03)*	3.94 *(2.23)**	1.77 *(2.47)*	0.26 *(2.36)*	0.58 *(1.34)*
output	**no**	**si**	1.36 *(3.40)*	6.49 *(3.44)**	6.80 *(4.71)*	0.06 *(5.35)*	0.95 *(3.22)*
input	**si**	**no**	2.01 *(1.04)**	1.21 *(0.99)*	1.48 *(0.60)***	-0.47 *(0.90)*	0.00 *(0.72)*
output	**si**	**no**	4.49 *(3.09)*	3.89 *(2.37)*	3.26 *(1.55)***	1.45 *(2.43)*	-1.03 *(2.11)*
input	**si**	**si**	1.50 *(0.98)*	0.75 *(0.82)*	1.80 *(0.54)****	-0.45 *(0.79)*	0.15 *(0.53)*
output	**si**	**si**	2.35 *(2.17)*	3.00 *(2.40)*	3.60 *(2.13)**	1.70 *(2.39)*	-1.10 *(2.08)*

Robust standard errors in brackets
** significant at 10%; ** significant at 5%; *** significant at 1%*
Coefficients' estimates can be interpreted in terms of euros per 1% increase in efficiency

the control variables, corresponding to the same transport indicators reported in Table 3 plus the availability of parks and gardens as a percentage of the municipal area, seems to affect mainly the residential quotations making the impact of efficiency less significant once these variables are included among the regressors.

7 Conclusions

Table 6: Point estimates of the impact of efficiency on the housing market quotations: suburbanzone

approach	c/cap.	controls	Residenziale	Terziario	Parcheggi	Commerciale	Produttivo
input	**no**	**no**	6.43 *(2.30)******	4.09 *(1.97)****	4.13 *(2.66)*	3.49 *(1.49)****	1.23 *(1.00)*
output	**no**	**no**	4.11 *(4.32)*	5.98 *(2.99)****	3.86 *(2.53)*	3.59 *(2.85)*	-0.03 *(1.38)*
input	**no**	**si**	5.25 *(2.49)****	3.68 *(1.77)****	2.77 *(2.28)*	3.37 *(1.49)****	0.80 *(0.93)*
output	**no**	**si**	4.92 *(4.34)*	5.96 *(2.83)****	4.23 *(2.64)*	5.18 *(2.92)**	0.53 *(1.52)*
input	**si**	**no**	2.23 *(1.09)****	1.14 *(0.51)****	0.69 *(0.66)*	0.32 *(0.51)*	0.29 *(0.42)*
output	**si**	**no**	6.74 *(4.54)*	2.48 *(1.85)*	1.97 *(1.71)*	1.74 *(1.91)*	-0.27 *(0.96)*
input	**si**	**si**	1.66 *(0.97)**	0.83 *(0.45)**	0.68 *(0.74)*	0.24 *(0.52)*	0.20 *(0.36)*
output	**si**	**si**	3.94 *(3.12)*	1.83 *(1.81)*	1.42 *(2.58)*	1.77 *(1.81)*	-0.62 *(1.00)*

Robust standard errors in brackets
** significant at 10%; ** significant at 5%; *** significant at 1%*
Coefficients' estimates can be interpreted in terms of euros per 1% increase in efficiency

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