Using Data Envelopment Analysis to Evaluate Environmentally Conscious Tourism Management

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Summary

This paper discusses a methodology to assess the performances of tourism management of local governments when economic and environmental aspects are considered as equally relevant. In particular, the focus is on the comparison and efficiency assessment of Italian municipalities located on the costal areas. In order to assess the efficiency status of the considered management units, Data Envelopment Analysis (DEA), a methodology for evaluating the relative efficiency of decision making units, is applied. The efficiency index measure used in DEA analysis accounts for both environmental and economic features correlated to the tourism industry. Further, potential managerial improvements for those areas resulting far from the efficiency frontier can be investigated.

Keywords: Data envelopment analysis, Sustainable tourism

JEL Classification: L83, M40, Q01

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Introduction

Decisions taken within the framework of tourism management may have important impacts on the environment, that may have in turn feedback effects on the tourism responses. More generally, tourism management practices that are environmentally focused may be reactive, e.g. responding to environmental regulations, or proactive, e.g. effective in order to be competitive with other tourist locations and to satisfy consumers' preferences.

To develop tools which support policy evaluation and decision making processes may be of critical importance in order to account for all different and often correlated features of the local management of tourism industry.

In order to give guidelines, to correct inefficient management directions and to promote positive effect of competition between municipalities, it will prove fundamental the use of performance indicators. Thus, finding a way to produce simple indicators summarizing different elements which characterize management strategies is crucial to the policy mechanisms. Indeed, as Hart emphasizes, an indicator is "something that helps you to understand where you are, which way you are going and how far you are from where you want to be" [Hart, 1997].

However, although indicators have a growing resonance in politics, it is often easier formulating them in theory rather than it is in practice. In addition to difficulties commonly encountered in selecting good indicators, there might be some additional problems specific to the tourism sector. Indeed, data on tourist areas are often incomplete and, in particular for what concerns measures of the tourism impact on the original ecosystem, for it is frequently impossible to disentangle the portion of the impact due to the autochthon population from the one directly deriving from the presence of tourism masses [Cammarota *et al.*, 2001], [Miller, 2001].

The focus of this paper is on the valuation of the efficiency of the management of tourist municipalities located on the coasts of Italy. The analysed dataset is composed of 194 municipalities. For each of them, the analysis takes into consideration a set of factors (inputs and outputs) which are considered relevant when valuing the performance of a management strategy, in view of both economic as well as environmental factors.

One major problem in measuring the efficiency of public organisations whose policies have market as well as non-market effects is that traditional economic measures, as benefit-cost ratio or net present value are difficult to apply. Moreover, measurements are often incommensurable, therefore assigning weights to different factors becomes crucial. In this paper, in order to overcome these difficulties, Data Envelopment Analysis (DEA) is applied. Indeed, DEA is a methodology which has been developed and successfully applied in order to deal with multiple and non commensurable input and output problems.

The paper is organised as follows. Section 1 provides the background of the decision environment, specifically dealing with the issue of the importance of managing tourism in a sustainable way and the DEA's use. In Section 2 a brief description of DEA methodology is given, while in Section 3 the data set, the model developed and the performed analysis are described. Section 4 is a description of main results and Section 5 concludes with a summary of main findings along with final remarks and future extensions.

1 The decision environment

The tourism industry is a sector of fundamental importance for the Italian economy (6,7 % of GDP in 1997) and its relevance is undoubtedly growing considering that the tourism flow has increased of the 18,6% during the period 1990-1997[2]. Further the 33,8% of tourism visits the coastal areas of Italy, with a resulting intense pressure on local ecosystems. As in more general cases, the Italian tourism industry has two main effects on the sustainable management of environmental resources, which work in opposite directions:

1) Negative impacts due to anthropization of natural areas, increased pollution on the air compartment (mainly due to increased traffic) and on the water compartment, abnormal production of waste, increased number of arsons in the woods.

[2] For general information and statistics on tourism in Italy see ISTAT publications [ISTAT, 1997].

2) Positive impacts due to the increased demand for high environmental standards, which is becoming essential in order for a tourist area to be competitive with other locations.
Hence, the necessity to assess the performance of the tourism management of Italian municipalities not only under pure economic considerations but also under the environmental sustainability paradigm. In particular, the assessment procedure proposed would be even more useful if it allowed not only to estimate how efficient is the status quo, but also which are the directions for potential improvements of the status quo, if any.

Potentially, relevant insights can be derived applying Data Envelopment Analysis, which is an approach first proposed in [Charnes *et al*., 1997] in order to measure relative efficiency of generally defined decision making units transforming multiple inputs in multiple outputs. DEA has been applied to evaluate the relative performance not only of public organizations, as the study on medical services in [Nyman and Bricker, 1989] and the one on educational institutions in [Charnes *et al*., 1981], but also of private organizations as banks, see for example [Charnes *et al*. 1990]. A thorough review of DEA theory and applications can be found in [Charnes *et al*. 1993]. In 1986 DEA has been first applied to the hospitality industry (see [Banker and Morey, 1986]), specifically to the restaurant section. Corporate travel management have been analysed in [Bell and Morey, 1995], while the hotel sector has been analysed in several works, see for example [Morey and Dittman, 1997] and [Anderson *et al*., 2000]. However, the relative performance of municipalities tourism management had never been analysed beforehand.

2 Methodology

The DEA is a multivariate technique for monitoring productivity and providing some insights on possible directions of improvements of the status quo, when inefficient. In particular, DEA is a non-parametric technique, i.e. it can compare input/output data making no prior assumptions about the probability distribution under study. The origin of non-parametric programming methodology, in respect to relative efficiency measurement, lies in the work of Charnes [Charnes, *et al*. 1978, 1979, 1981]. Although DEA is based on the concept of efficiency that is near to the idea of a classical production function, the latter is typically determined by a specific equation, while DEA is generated from the data set of observed operative units (Decision Making Units or DMUs). The DEA efficiency scored of any DMU is derived from the comparison with the other DMUs that are included in the analysis, considering the maximum score of unity (or 100%) as a benchmark. The score is independent of the units in which outputs and inputs are measured, and this allows for a greater flexibility in the choice of inputs and outputs to be included in the study.

An important assumption of the DEA is that all DMUs face the same unspecified technology and operational characteristics, which defines the set of their production possibilities.

The idea of measuring the efficiency of DMUs with multiple inputs and outputs is specified as a linear fractional programming model. A commonly accepted measure of efficiency is given by the ratio of the weighted sum of outputs over the weighted sum of inputs. It is however necessary to assess a common set of weights and this may rise some problems. With DEA methodology each DMU can freely assess its own set of weights, that can be inferred through the process of maximizing the efficiency. Given a set of N DMUs, each producing J outputs from a set of I inputs, let us denote by y_{jn} and x_{in} the vectors representing the quantities of outputs and inputs relative to the m-th DMU, respectively. The efficiency of the m-th DMU can thus be calculated as:

$$e_m = \frac{\sum_{j=1}^{J} u_j y_{jm}}{\sum_{i=1}^{I} v_i x_{im}}, \qquad \begin{bmatrix} j = 1,..,J \\ i = 1,..,I \end{bmatrix} \tag{1}$$

where u_j and v_i are two vectors of weights that DMU m uses in order to measure the relative importance of the consumed and the produced factors. As mentioned, the set of weights, in DEA, is not given, but is calculated through the DMU's maximization problem, that is stated below for the m-th DMU.

$$\max e_m$$
$$s.t.$$
$$\frac{\sum_{j=1}^{J} u_j y_{jn}}{\sum_{i=1}^{I} v_i x_{in}} \leq 1 \quad \forall n = 1,.,m,.,N \tag{2}$$
$$0 \leq u_j \leq 1$$
$$0 \leq v_i \leq 1$$

To simplify computations it is possible to scale the input prices so that the cost of the DMU m's inputs equals 1, thus transforming problem set in (2) in the ordinary linear programming problem stated below:

$$\max h_m = \sum_{j=1}^{J} u_j y_{jm}$$
$$s.t.$$
$$\sum_{i=1}^{I} v_i x_{im} = 1 \tag{3}$$
$$\sum_{j=1}^{J} u_j y_{jn} - \sum_{i=1}^{I} v_i x_{in} \leq 0 \quad \forall n = 1,.,m,.,N$$
$$\varepsilon \leq u_j \leq 1,\ \varepsilon \leq v_i \leq 1,\ \varepsilon \in \Re^+$$

In addition to the linearization, a further constraint is imposed on weights that have to be strictly positive, in order to avoid the possibility that some inputs or outputs may be ignored in the process of determination of the efficiency of each DMU.

If the solution to the maximization problem gives a value of efficiency equal to 1, the corresponding DMU is considered to be efficient or non-dominated, if the efficiency value if inferior to 1 then the corresponding DMU is dominated, therefore does not lays on the efficiency frontier, which is defined by the efficient DMUs.

Let us consider a simple example of five DMUs (tourism management units), denoted as A, B, C, D and E in Figure 1, each using different combinations of two inputs, say labour and number of beds, required to produce a given output quantity, say, number of tourists (data are summarized in Table 1). In order to facilitate comparisons, input level must be converted to those needed by each DMU to "produce" one tourist.

Data plotted in Figure 1 are abstracted from differences in size. A kinked frontier is drawn from A to C to D and the frontier envelopes all the data points and approximates a smooth efficiency frontier using information available from the data only. DMUs (municipalities) on the efficient frontier of our simple example, are assumed to be operating at best practice (i.e. efficiency score equal to one). While, management units B and D are considered to be less efficient. DEA compares B with the artificially constructed municipality B', which is a linear combination of A and C. municipalities A and C are said to be the "peer group members" of B and the distance BB' is a measure of the efficiency of B. Compared with its benchmark B', municipality B is inefficient because it produces the same level of output but at higher costs.

As for every linear programming problem, there exist a dual formulation of the primal formulation of the maximization problem outlined in (3), which has identical solution. While the primal problem can be interpreted as an output oriented formulation (for a given level of input, DMUs maximizing output are preferred), the dual problem can be interpreted as an input oriented formulation (for a given level of output, DMUs minimizing input are preferred).

The model presented above does not take into consideration scale effect. However, when DMUs are not all operating at an optimal scale, as it frequently happens in the case of tourism management, it becomes necessary to extend the basic model as presented in (3) in order to account for variable returns to scale. In the present work, the extension of the constant return to scale DEA model to account for variable returns to scale situation suggested by Banker and others in [Banker *et al.*, 1984], has been applied.

Finally, in order to perform dynamic analysis, thus producing not only a static pictures of efficiency, but considering the evolution of efficiency of each municipality, the window approach first put forward by Charnes and others [Charnes *et al.*, 1978] has been used. The DEA is performed over time using a moving average similar procedure, where a municipality in each different period is treated as if it were a 'different' municipality. In other words, a municipality's performance in a particular period is contrasted with its performance in other periods in addition to performance of the other municipalities.

3 Data, Models and Analysis Performed

In our analysis, the decision making unit represents a municipality producing the tourism good given two different inputs. The first being the cost of managing tourism infrastructures and, more generally, of the production of tourism services. The second being the environmental cost deriving from the increased number of people depending on the same environmental endowment.

Data used in the analysis is from ISTAT[3], Ancitel[4] and ARPA[5]. Table 2 summarizes inputs and outputs specification that have been considered for each of the municipality.

Table 2 Inputs and outputs specification in the model, sources in brackets.

INPUT
Number of beds: Proxy for management costs (ISTAT) **Solid Waste**: Proxy for environmental costs (ARPA)
OUTPUT
Rate of use: Proxy for profit from tourism (ANCITEL) Tourism presences / number of beds

Data collected are relative to years 2000/2001. On the input side, management and environmental costs have to be captured. The number of beds is considered as an approximation for management expenses and it is computed adding up the number of beds in hotels, camping, registered holiday houses and other receptive structures. As a matter of fact, in south of Italy there is a very high percentage of second houses rented

3 Istat - National Institute of Statistics. Tourism Statistics for year 2000-2001.

4 Ancitel S.p.A. society of services of the National Association of Italian Municipalities.

5 ARPA, Italian Regional agencies for the Environment.

to tourists which are not registered as holiday houses. Indeed, the actual tourism flows are not clearly known for those areas and for this reason the analysis has been performed solely on municipalities located in northern and central Italy, restricting the DMU sample from the original 194 to 70 municipalities.

As an indicator for environmental costs data on yearly tons of solid waste produced in each municipality has been collected (Modelli Unici di dichiarazione Ambientale). Italian tourism is extremely seasonal. Indeed, 23% of annual visitors is concentrated in August, when generally considering tourism in Italian seaside resorts, but the phenomena is even more intense when considering resorts located in the southern regions (over 30% of visitors are concentrated in August). Therefore, an indicator of the temporal distribution of waste production would be extremely helpful in definig how severe environmental costs due to tourism are. However, data on municipal waste production divided per month do not exist, yet. Hence, for the purposes of the present study we rely on a yearly aggregated indicator.

On the output side, an indicator measuring the rate of use of existing beds has been used as a general approximation for profit deriving from the tourist industry. As mentioned above, the presence of a well-developed tourism industry may represent an incentive for environmental protection. While in the present study we consider such environmental benefit implicitly as part of the tourism profit indicator, in future extension it would be desirable to consider it in the analysis as a separate indicator.

As far as models are concerns, in the present study output-oriented models have been preferred to input-oriented ones, as they suit more issues considered as relevant for management purposes and they better help in addressing the germane questions, given the nature of input and output indicators. In particular, the number of beds has been modeled as an uncontrollable input, while the quantity of solid waste (the environmental cost) as been considered as controllable input. Indeed, in order to augment the efficiency of an inefficient municipality, the most direct policy lever is to introduce constraints on the uncontrolled deployment of environmental resources, rather than restricting the dimension of the tourism business. It is arguable that, policy actions undertaken in order to control for inefficiency, should not go to the detriment of the tourism industry itself.

Variable return to scale models have been mainly considered given the presence of regional or local budget constraints, imperfect competition, constraints on finance, etc., which may cause one or more DMUs to be not operating at optimal scale.

However, an analysis using a constant return to scale DEA model has also been conducted on the same data set in order to disentangle the inefficiency component due to ‘pure’ technical inefficiency from the one due to ‘scale’ inefficiency.

As mentioned, following some preliminary tests, the main analysis were performed on a sub-sample of the original data set. Indeed, municipalities belonging to regions located in south of Italy and on the islands (Sicilia and Sardegna) have been excluded from the analysis because of the scarce reliability of information concerning the effective number of beds. Thus, the set of DMUs which will be referred as the data set does not included municipalities belonging to the mentioned areas.

First, an output-oriented variable return to scale model has been used to compute the relative static efficiency of 70 Italian municipalities, for years 2000 and 2001. For comparative purposes the same data set has been analysed through an input-oriented analysis.

However, the repeated application of DEA through the two years data sets produces little more than a continuum of static results. In reality the behaviour underlying the production processes is likely to be dynamic because tourism management may take well far more than one time period to adjust the output levels given the input factors. Furthermore, environmental costs have a multi-periods dimension since they generate effects which are generally visible in future periods.

Consequentially, it appears more interesting to get an idea of how the efficiency of such municipalities is performing over time, rather than giving just a static picture.

Thus, an input-oriented variable return to scale model has been used to compute the dynamic efficiency of the group of municipalities over years 2000/2001.

4 Results

Main results and findings of the static and the dynamic analysis are given below.

The input-oriented static analysis performed over the data set produces a ranking of the considered municipalities (in Figure 2 we give the efficiency scores for the first 20 municipalities, the whole data set ranking being too large to be shown here), where 100 is the maximum level of efficiency and 0 is the minimum.

Data can be presented in several ways. One possible ex-post transformation is to compute the average efficiency score for each region, as shown in Figure 3.

In Figure 4, we then represent the first 20 scoring municipalities in the output-oriented static analysis. This ranking differs slightly from the previous one, because the procedure used here gives greater importance to higher rate of use rather than to lower costs. The analysis, for each municipality, specifies not only the relative efficiency scores, but also potential improvements in the case of scores lower than 100. Let us concentrate on a specific example, the case of Deiva Marina, Liguria. As shown in Figure 5 for Deiva Marina, the efficiency score is 46.27%, the main potential improvements falling within the category of the environmental domain. Indeed, the main lever to increase efficiency would be a decreased quantity of yearly produced waste, which is an input with both economic and environmental costs. The information about the relative efficiency score, but also concerning potential improvements in case of inefficiency are calculated from the comparison with the member/s of the peer group (as shown in Figure 6 in the case of Deiva Marina, Liguria, the peer group is composed by Vernazza, Liguria). Indeed, in order to find the projection of Deiva Marina on the efficiency frontier, i.e. to compute the virtual DMU which represents Deiva Marina but managed fully efficiently, it is necessary to compare it with a peer group belonging to the efficiency frontier. However, the members of the peer group do not necessary belong to the same geographical area where the inefficient DMU is located, but may as well be in a very different area. The information concerning municipalities composing the peer group may be valuable in promoting the exchange of management guidelines between areas which are far one from another, with mutual benefit.

As mentioned in the previous section, a static analysis has been performed also using a constant return to scale model, in order to capture separately 'scale' inefficiency and 'technological' inefficiency. Indeed, while the constant return to scale model capture together both sources of inefficiency, the variable return to scale model capture exclusively 'technological' inefficiency'. When comparing results from both study (see Figure 7) it becomes clear how scale inefficiency has by far a greater effect on the performance scores of inefficient municipalities.

The necessity to capture dynamic trends in the efficiency levels has naturally lead to the designing of the second set of analysis, which is performed on the same data set, but in a dynamic framework. Again, the analysis produces a ranking for each of the three sub groups of the considered municipalities (in Figure 8 the first 20 municipalities are presented). However, now each municipality performance in 2001 is compared to other municipalities' performances as well as to its own performance in year 2000. In the case of Vernazza, for example, there appears to be a worsening in the efficiency going from year 2000 to 2001. While, the contrary happens for the case of Portofino, which appears to improve the efficiency score in time.

Finally, general information on aggregated potential improvements are summarized in Figure 9. This information could be valuable when considering different potential investment and different guidelines formulation, in the direction of improving the tourism industry from a national government perspective.

5 Final Remarks

Data Envelopment Analysis can be effectively applied in assessing economic and environmental performances of tourism management. This can be even more useful for countries, as in the case of Italy, where the tourism industry has both increasing economic relevance and a growing impact on the environment. As discussed in the present paper, DEA analysis produces relative efficiency indices for each considered municipality and also gives useful information concerning which lever should be more effective in order to move to higher levels of efficiency.

Although the present study does provide important insights on the issue of sustainable tourism management, there are some important further steps that should be considered:

- to analyze in detail the relative efficiency of specific services for tourists as natural areas, beaches, etc.;
- to extend the data set in order to include southern Italian regions and, furthermore, other European tourist resorts;
- to extend the study to a greater number of time periods in order to get a better picture of trends and dynamic processes;
- to make ex-post analysis of the efficiency scores in order to understand how tthey are related with other important economic factors, such as income, and above all, the geographic position, through regression analysis. Indeed, flows of tourists are very non-homogenous through the peninsula, both in quantity (e.g. only the 19,2% of tourism flow interests southern regions) and quality (e.g. just 13% of foreign tourists go to southern regions).

Finally, data on tourism flow are scarce and incomplete (in particular data concerning southern Italian regions), and this kind of studies will largely benefit from more accurate data collections. In the mean time, these types of study may represent an incentive for municipalities to promote data collection processes.

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Tables and Figures

Table 1 Example Data

DMUs	Labour	Beds	Tourists	Labour per tourist	Beds per tourists
A	200	600	200	1	3
B	600	1200	300	2	4
C	200	200	100	2	2
D	600	300	200	3	1.5
E	500	200	100	5	2

Figure 1 An example of efficient frontier with 5 DMUs

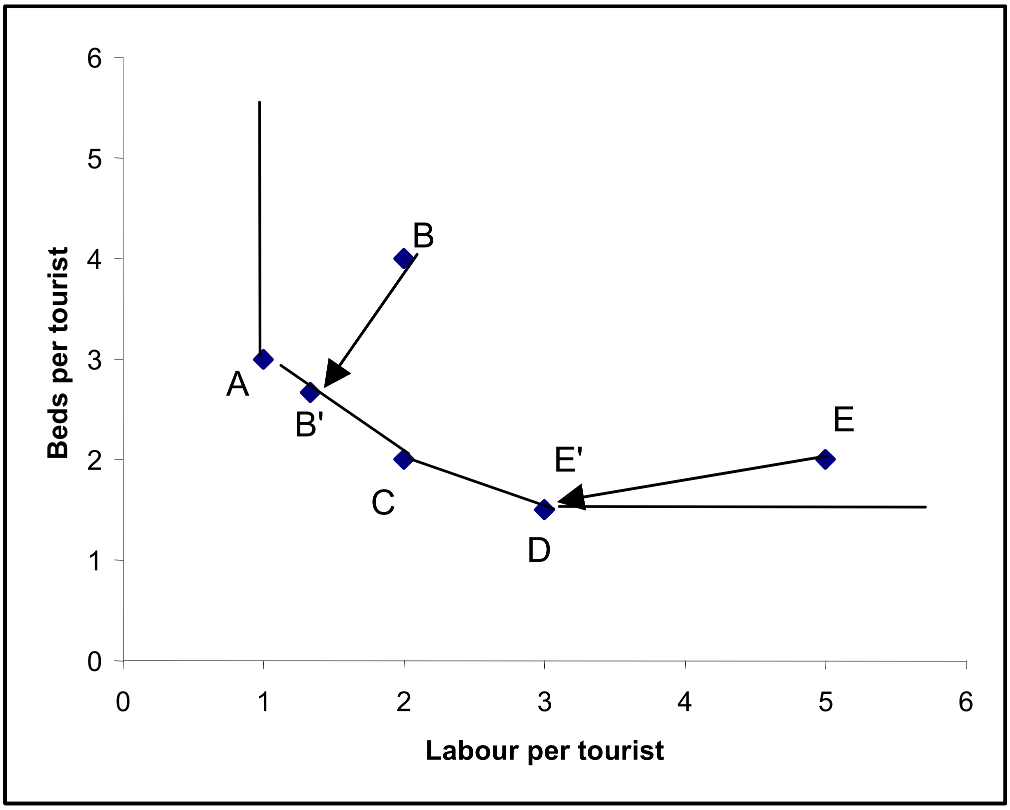


Figure 2. First 20 scoring municipalities in the input-oriented static analysis, data are relative to year 2001.

Comuni	Efficency Score
RIO NELL'ELBA	100
RIVA LIGURE	100
VERNAZZA	100
SANTO STEFANO AL MARE	99,57
PORTOFINO	83,8
BONASSOLA	69,01
RIOMAGGIORE	66,84
CERVO	60,36
DEIVA MARINA	46,27
ISOLA DEL GIGLIO	45,04
MONTEROSSO AL MARE	44,92
MONEGLIA	43,85
MARCIANA MARINA	42,38
RIO MARINA	39,29
NOLI	37,77
SIROLO	30,71
LAIGUEGLIA	29,07
CAMOGLI	28,85
MARCIANA	28,24
OSPEDALETTI	27,94
PORTOVENERE	27,28

Figure 3. Average scoring of Italian regions, data are relative to year 2001.

Italian Regions	Average of efficiency score
LIGURIA	33,63
TOSCANA	19,42
LAZIO	15,09
MARCHE	9,13
VENETO	5,52
EMILIA ROMAGNA	2,27

Figure 4. First 20 scoring municipalities in the output-oriented static analysis, data are relative to year 2001.

Comuni	Efficency Score
RIO NELL'ELBA	100
RIVA LIGURE	100
VERNAZZA	100
SANTO STEFANO AL MARE	99,5
CAMOGLI	56,93
PORTOFINO	30,4
SANTA MARGHERITA LIGURE	27,54
OSPEDALETTI	27,4
MONTE ARGENTARIO	23,84
RAPALLO	23,69
PORTOVENERE	19,9
BONASSOLA	19,09
TAGGIA	17,34
SAN REMO	16,1
MONTEROSSO AL MARE	14,98
NOLI	14,6
ANDORA	13,4
CELLE LIGURE	12,99
FOLLONICA	12,54
BORDIGHERA	11,09
FORTE DEI MARMI	10,81

Figure 5. Deiva Marina (Liguria), efficiency score 2001: 46.27. Suggested improvements.

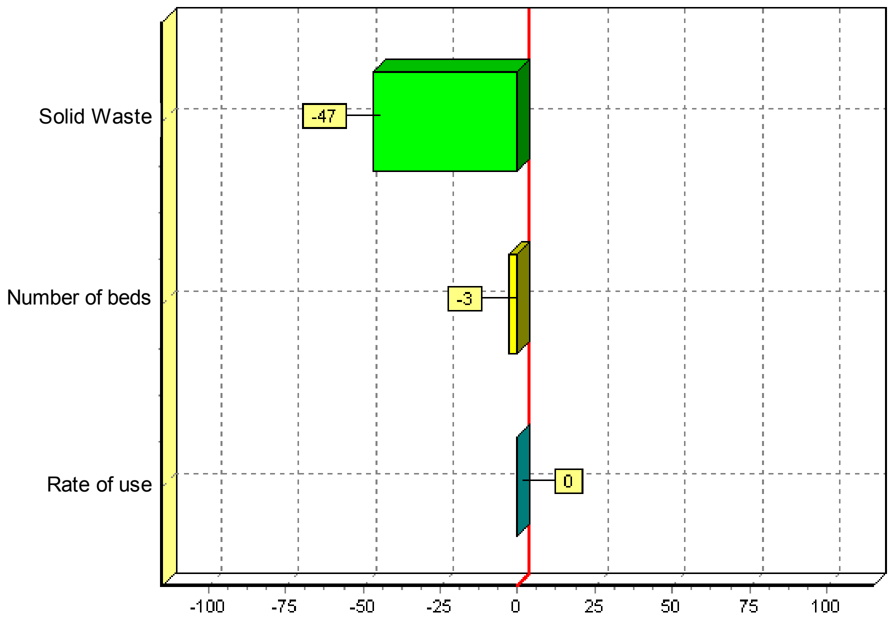


Figure 6. Deiva Marina's peer group (Vernazza, Liguria).

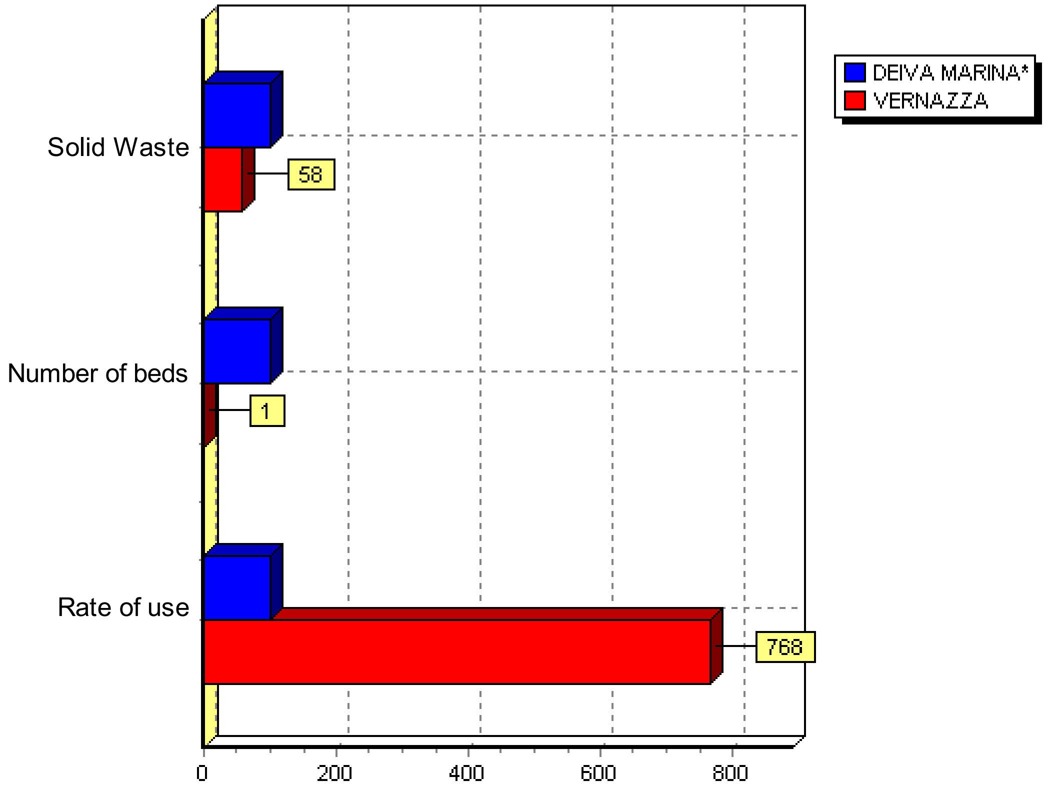


Figure 7. Input – oriented, constant return to scale versus variable return to scale model (Italy, 2001).

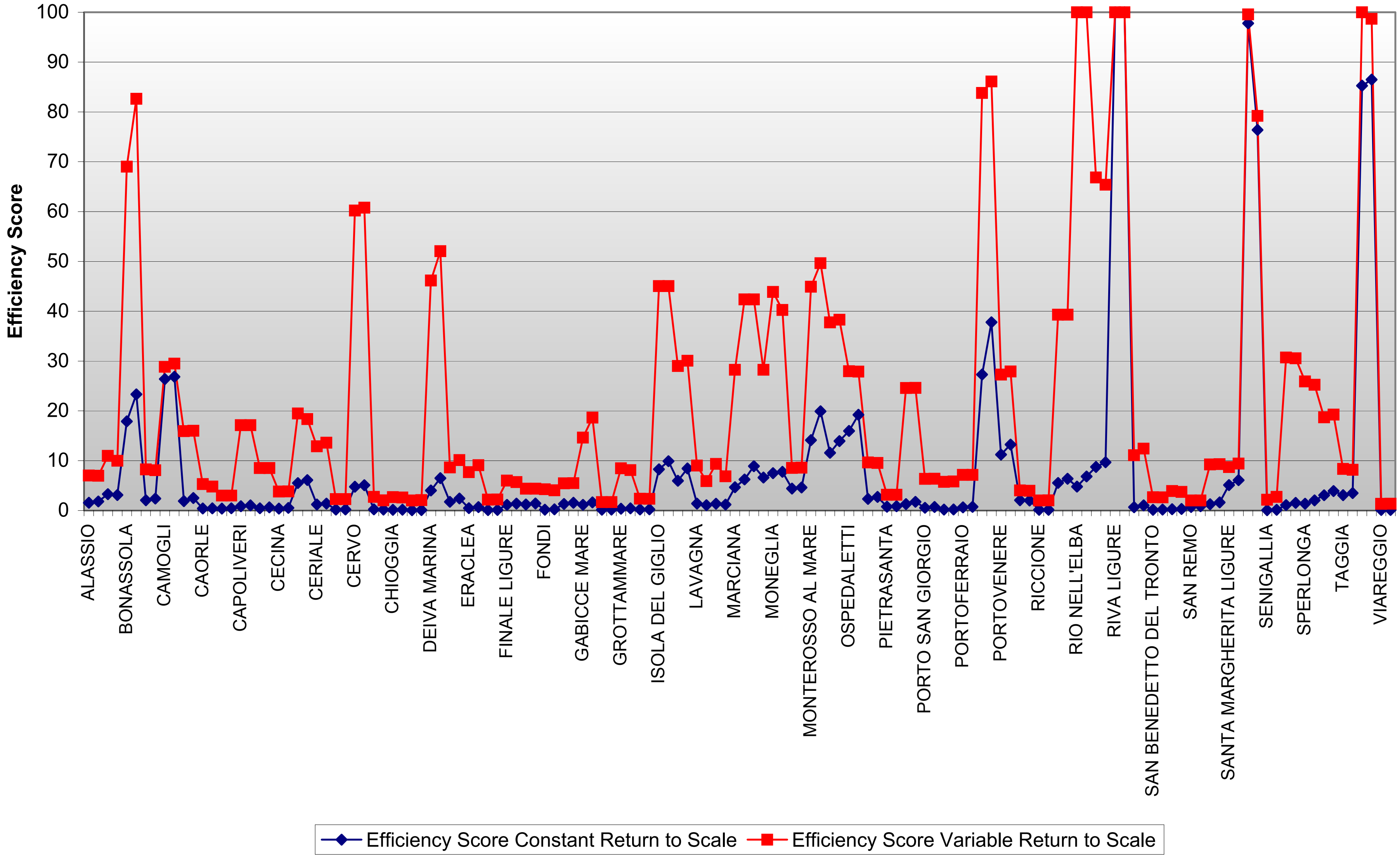
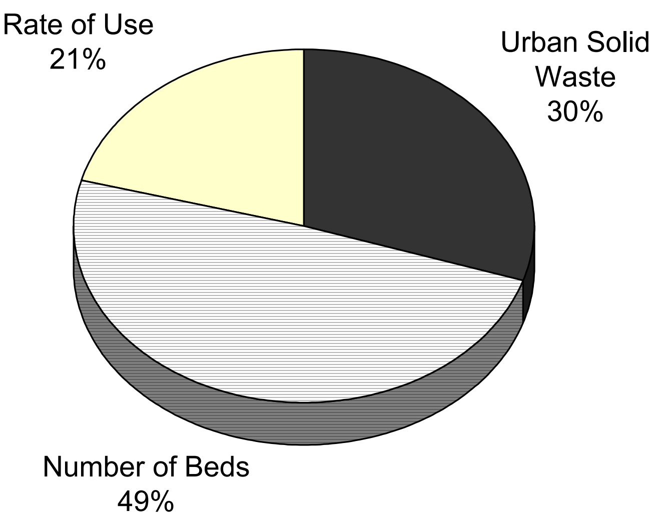


Figure 8. First 20 scoring municipalities in dynamic analysis results. (If labelled with * data are relative to year 2001, if not to year 2000).

Municipality (DMU)	Efficency Score
VERNAZZA	100
RIVA LIGURE	100
RIVA LIGURE*	100
SANTO STEFANO AL MARE	99.5
VERNAZZA*	98.28
SANTO STEFANO AL MARE*	76.86
RIO NELL'ELBA	70.37
CAMOGLI	52.77
CAMOGLI*	51.7
PORTOFINO*	42.4
OSPEDALETTI*	30.59
PORTOFINO	30.4
SANTA MARGHERITA LIGURE*	28.4
BONASSOLA*	25.95
SANTA MARGHERITA LIGURE	25.53
OSPEDALETTI	25.4
MONTE ARGENTARIO*	23.29
MONTE ARGENTARIO	22.1
RAPALLO	21.96
RAPALLO*	21.72

Figure 9 Total Potential Improvements. Input – oriented, variable return to scale model



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(lix) This paper was presented at the ENGIME Workshop on “Mapping Diversity”, Leuven, May 16-17, 2002

(lx) This paper was presented at the EuroConference on “Auctions and Market Design: Theory, Evidence and Applications”, organised by the Fondazione Eni Enrico Mattei, Milan, September 26-28, 2002

(lxi) This paper was presented at the Eighth Meeting of the Coalition Theory Network organised by the GREQAM, Aix-en-Provence, France, January 24-25, 2003

(lxii) This paper was presented at the ENGIME Workshop on “Communication across Cultures in Multicultural Cities”, The Hague, November 7-8, 2002

(lxiii) This paper was presented at the ENGIME Workshop on “Social dynamics and conflicts in multicultural cities”, Milan, March 20-21, 2003

(lxiv) This paper was presented at the International Conference on “Theoretical Topics in Ecological Economics”, organised by the Abdus Salam International Centre for Theoretical Physics - ICTP, the Beijer International Institute of Ecological Economics, and Fondazione Eni Enrico Mattei – FEEM Trieste, February 10-21, 2003

(lxv) This paper was presented at the EuroConference on “Auctions and Market Design: Theory, Evidence and Applications” organised by Fondazione Eni Enrico Mattei and sponsored by the EU, Milan, September 25-27, 2003

(lxvi) This paper has been presented at the 4th BioEcon Workshop on “Economic Analysis of Policies for Biodiversity Conservation” organised on behalf of the BIOECON Network by Fondazione Eni Enrico Mattei, Venice International University (VIU) and University College London (UCL) , Venice, August 28-29, 2003

(lxvii) This paper has been presented at the international conference on “Tourism and Sustainable Economic Development – Macro and Micro Economic Issues” jointly organised by CRENoS (Università di Cagliari e Sassari, Italy) and Fondazione Eni Enrico Mattei, and supported by the World Bank, Sardinia, September 19-20, 2003

(lxviii) This paper was presented at the ENGIME Workshop on “Governance and Policies in Multicultural Cities”, Rome, June 5-6, 2003

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