Marzetti, Silvia; Mosetti, R.

Working Paper
Social Carrying Capacity of Mass Tourist Sites: Theoretical and Practical Issues about its Measurement

Nota di Lavoro, Fondazione Eni Enrico Mattei, No. 144.2005

Provided in Cooperation with:
Fondazione Eni Enrico Mattei (FEEM)


This Version is available at:
http://hdl.handle.net/10419/73931

Terms of use:
Documents in EconStor may be saved and copied for your personal and scholarly purposes.
You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.
Social Carrying Capacity of Mass Tourist Sites: Theoretical and Practical Issues about its Measurement
S. Marzetti Dall’Aste Brandolini and R. Mosetti

NOTA DI LAVORO 144.2005

NOVEMBER 2005

NRM – Natural Resources Management

S. Marzetti Dall’Aste Brandolini, Department of Economics, University of Bologna
R. Mosetti, Istituto Nazionale di Oceanografia e Geofisica Sperimentale, OGS, Trieste

This paper can be downloaded without charge at:
The Fondazione Eni Enrico Mattei Note di Lavoro Series Index:
http://www.feem.it/Feem/Pub/Publications/WPapers/default.htm

Social Science Research Network Electronic Paper Collection:
http://ssrn.com/abstract=856024

The opinions expressed in this paper do not necessarily reflect the position of Fondazione Eni Enrico Mattei
Corso Magenta, 63, 20123 Milano (I), web site: www.feem.it, e-mail: working.papers@feem.it
Social Carrying Capacity of Mass Tourist Sites: Theoretical and Practical Issues about its Measurement

Summary

Congestion is an important management problem at mass tourist sites. This essay focuses on the social carrying capacity (SCC) of a tourist site as indicator of residents’ and visitors’ perception of crowding, intended as the maximum number of visitors (MNV) tolerated. In case of conflict between the residents’ MNV tolerated and the visitors’ MNV tolerated, the policy-maker has to mediate. We consider the case in which the residents’ SCC is lower than the visitors’ SCC, and the site SCC is the result of a compromise between these two aspects of the SCC. This can be measured by making reference to two criteria of choice: the utility maximisation criterion and the voting rule. The use of one method rather than the other depends on the data available about the individual preferences on crowding. Assuming that individual preferences are known, a maximisation model for the computation of the site SCC is conceived. It represents the case in which the residents’ SCC is the limiting factor. The site SCC is intended as the number of visitors which maximises the social welfare function. Because a local policy-maker maximises the welfare of residents, in this model visitors are represented by those residents whose welfare wholly depends on the tourism sector, while the social costs due to crowding are borne by those residents who are partially or totally independent from tourism. Nevertheless, in practice, the individual preferences about crowding are not always known. In this case, the MNV tolerated can be computed by applying the majority voting rule. It is shown that, under certain conditions, the optimum number of visitors, obtained through a maximisation model, is equal to the MNV tolerated by the majority of voters.

Keywords: Sustainable tourism development, Tourism carrying capacity, Social carrying capacity, Maximisation criterion, Majority voting rule, Overcrowding, Mass tourist site

JEL Classification: L83, Q01, Q26, Q58

This paper was presented at the Second International Conference on "Tourism and Sustainable Economic Development - Macro and Micro Economic Issues" jointly organised by CRENoS (Università di Cagliari and Sassari, Italy) and Fondazione Eni Enrico Mattei, Italy, and supported by the World Bank, Chia, Italy, 16-17 September 2005.

Address for correspondence:

Silvia Marzetti
Department of Economics
University of Bologna
P.zza Scaravilli 2
40126 Bologna
Italy
Phone: +39 512098130
Fax: +39 51221968
E-mail: marzetti@economia.unibo.it
Social Carrying Capacity of Mass Tourist Sites: Theoretical and Practical Issues about its Measurement

S. Marzetti Dall’Aste Brandolini\textsuperscript{a} and R. Mosetti\textsuperscript{b}

\textsuperscript{a} Department of Economics, University of Bologna, Italy.
\textsuperscript{b} Istituto Nazionale di Oceanografia e Geofisica Sperimentale, OGS, Trieste, Italy.

Abstract

Congestion is an important management problem at mass tourist sites. This essay focuses on the social carrying capacity (SCC) of a tourist site as indicator of residents’ and visitors’ perception of crowding, intended as the maximum number of visitors (MNV) tolerated. In case of conflict between the residents’ MNV tolerated and the visitors’ MNV tolerated, the policy-maker has to mediate. We consider the case in which the residents’ SCC is lower than the visitors’ SCC, and the site SCC is the result of a compromise between these two aspects of the SCC. This can be measured by making reference to two criteria of choice: the utility maximisation criterion and the voting rule. The use of one method rather than the other depends on the data available about the individual preferences on crowding. Assuming that individual preferences are known, a maximisation model for the computation of the site SCC is conceived. It represents the case in which the residents’ SCC is the limiting factor. The site SCC is intended as the number of visitors which maximises the social welfare function. Because a local policy-maker maximises the welfare of residents, in this model visitors are represented by those residents whose welfare wholly depends on the tourism sector, while the social costs due to crowding are borne by those residents who are partially or totally independent from tourism. Nevertheless, in practice, the individual preferences about crowding are not always known. In this case, the MNV tolerated can be computed by applying the majority voting rule. It is shown that, under certain conditions, the optimum number of visitors, obtained through a maximisation model, is equal to the MNV tolerated by the majority of voters.

Keywords: sustainable tourism development, tourism carrying capacity, social carrying capacity, maximisation criterion, majority voting rule, overcrowding, mass tourist site.

1 Introduction

Tourism}\textsuperscript{1} is one of the fastest expanding sectors of the world economy. In the EU its contribution to the total GDP is about 4.7%. Visitors influence the social, cultural and economic activities of a site, resident lifestyle and public policy-making. They are very sensitive to social, cultural and environmental quality; therefore tourist sites have to be

\textsuperscript{1} The tourism sector is intended in the broad sense, in that it is made up of both tourists or overnight visitors (people who visit the site and stay at least one night) and same-day visitors (people who visit the site, but do not sleep there) (World Tourism Organization, 1998).
managed according to sustainable criteria otherwise they will lose their ability to generate welfare.

Every process of tourism growth has to be sustained by the tourism carrying capacity (TCC) of the site. In this way, policy-makers must pursue sustainable tourism through ‘a rational distribution of tourism activity…without exceeding the saturation limits of each area…according to its vulnerability and characteristics’ (Decleris, 2003, p.86).

In general, the concept of carrying capacity applied to the human species ‘is foremost socially determined, rather than biologically fixed due to the important influence of human consumption patterns, technologies, infrastructure, and impacts on the environment or food availability’ (Seidl & Tisdell, 1999). Applied to tourism, the TCC means that tourist economic growth has to be responsible towards local society and its cultural values, and compatible with the preservation and improvement of the local natural environment and with the conservation of the local traditional economic activities.

A tourist system is an integrated system constituted by different sub-systems, such as the ecological (biological and physical), social, cultural, infrastructural and management (institutional and economic) sub-systems (World Tourism Organization, 1998, 2004). Therefore the TCC is the result of the carrying capacities of all these sub-systems. The levels of these different carrying capacities may be in conflict; for example, mass tourism may be desirable from the economic point of view because it increases the local aggregate income, but from the social and ecological point of view it can be damaging if criminality increases and dunes are destroyed. This means that, in practice, policy-makers have to mediate between these different carrying capacities, also stimulating discussion about society values in order to change their plans and actions if necessary.

In this paper we focus on the social aspect of the carrying capacity. In literature, the social carrying capacity (SCC) is in general analysed both from the point of view of residents and from that of visitors. We consider mass tourism sites, because high-density recreational activities today are the predominant kind of tourism in Europe. Tourism is generally a seasonal economic activity and, on the most crowded days of the year, traffic, criminality, waiting time, and noise by day and by night are major causes of residents’ discomfort, and the quality of the visitors’ recreational experience deteriorates. Therefore, we present a joint analysis of these two aspects of the SCC in order to establish the site SCC by using a cost-benefit analysis (CBA) model based on the maximisation of individual preferences. Nevertheless, because sustainable tourism development means that real choices have to be made, we also highlight that a further criterion of choice is needed when preferences about crowding are unknown.

Section 2 briefly describes the CBA in order to measure the TCC as indicator of sustainable tourism. In section 3 the focus is on the site SCC as indicator of residents’ and visitors’ perception of crowding. We make particular reference to the case of conflict given by the situation in which the residents’ SCC is lower than the visitors’ SCC. Assuming that it is possible to measure the utility loss due to crowding, a solution of this conflict is described by a CBA model in which the policy-maker mediates between residents’ and visitors’ claims. Section 4, instead, focuses on the case in which the utility loss due to crowding cannot be estimated, and the voting criterion of the majority rule is applied. We present the conditions to be satisfied in order to make the optimum number of visitors obtained through a maximisation model equal to the MNV tolerated by the majority of voters.

2. Tourism Carrying Capacity and Cost-benefit Analysis

Different indicators are used for the TCC measurement because not only the number of visitors, tourist density and length of stay, but also visitors’ life style and their impact on the natural environment, facilities, infrastructures and residents’ life style have to be considered.
Nevertheless there continues to be the demand for representing the TCC with a single indicator. In economic literature the number of visitors is generally used (Fisher and Krutilla, 1972; Cicchetti and Smith, 1973; Canestrelli and Costa, 1991). Given the specific characteristics of tourism in the site considered, the TCC is defined as the maximum number of visitors (MNV) that can be contained in a tourist area. We make reference to the number of visitors present on a site per day.

In order to estimate a sustainable and efficient MNV, the CBA is applied. Economic efficiency states that tourist resources are rationally used if the difference between their benefits and costs is maximised; while sustainability requires social and environmental goods that the market does not evaluate to be considered in this computation. Therefore, by making reference to a CBA model the TCC is identified with the optimum number of visitors which maximises the social net benefit (Fisher and Krutilla, 1972). Let us consider the following very simple static model:

\[
\max_Q \Pi(Q) = NB(Q) - C_S(Q) - C_E(Q), \tag{1}
\]

where: \(\Pi(Q)\) is the total net benefit from tourism activity, \(NB(Q)\) the private net benefit from tourist production, \(C_S(Q)\) the social costs (such as noise, pollution, stress from crowding, and so on), \(C_E(Q)\) the value of environmental losses (a loss of biodiversity such as dune reduction, for example), and \(Q\) the number of visitors per day. It is, in general, assumed that the net marginal private benefit from tourism decreases with the number of visitors, while the social marginal cost and the environmental marginal cost increase. The optimum number of visitors \(Q^*\) has to satisfy the condition of equality between the net marginal benefit and the sum of the social and environmental marginal costs.

3. Social Carrying Capacity: the Maximisation Criterion

We cannot deal here with all the different aspects of the TCC. Our attention is devoted to the SCC computation in situations in which mass tourism determines crowding effects. Noise, criminality and waiting time represent social aspects of the TCC. Residents’ quality of life and visitors’ recreational experience can deteriorate as the number of visitors increases. As regards the optimal level of use from the ecological point of view, we assume that it is not a limiting factor. For example, natural resources used for recreational activities, such as numerous beaches, are very extensive, or the ecological aspect has greatly lost its importance because the natural environment has already been sacrificed heavily to tourist growth.

According to the CBA, the SCC of a tourist site can be in general defined as the optimum number of visitors per day to which the maximum social utility due to congestion corresponds. More specifically, in literature the SCC of a tourist area is defined from two different points of view. From the point of view of residents, the SCC represents the social interaction between residents and visitors, and it is the MNV tolerated by the host population without reducing their quality of life. From the point of view of visitors, the SCC describes the interaction between the visitors themselves, and is defined as the MNV tolerated by the visitors themselves without reducing the quality of the recreational experience or desiring to go to an alternative site or return home. These two aspects of the SCC may be in conflict, since the MNV tolerated by the visitors themselves may be different from the MNV tolerated by residents.

The shape of the individual utility curve highlights the psychological nature of the perception of overcrowding. In general, when an overcrowding sensation begins to be felt, the individual total utility \(U\) starts to reduce, the marginal utility becomes negative, and this means that the total number of visitors on the site exceeds the maximum number tolerated. In addition, different individuals (whether residents or visitors) may be sensitive to different level of crowding. Figure 1 shows, as an example, two different situations: curve (a)
represents the total utility $U$ of an individual whose satisfaction from the presence of visitors is quite low, and who is quite sensitive to crowding because the overcrowding sensation begins to occur to the right of the fairly low daily number of visitors $Q_1$; while curve (b) represents a person whose satisfaction is high and who becomes sensitive to crowding with large numbers of visitors (overcrowding begins at $Q_2$) (Clawson and Knetsch, 1978; Marzetti, 2003).

Figure 1: Residents’ or visitors’ utility

3.1 Measuring the utility loss due to crowding
Residents' and visitors' losses of welfare due to overcrowding are not generally evaluated by the market. Nevertheless, measuring the SCC through the CBA requires them to be estimated with a specific method.

The CVM is a technique conceived by economists to estimate in monetary terms those values which are not established by the market. It is based on the economic theory of demand (individual preferences) and its philosophy is: when the value of something is unknown, go to those who might value it and ask how much they evaluate it (Price, 2000). Through a survey by questionnaire the CVM creates a hypothetical market which permits respondents to elicit, according to their preferences, the value of the non-marketable consequences of a change in the number of visitors to a site. The value so elicited is contingent to the scenario created through the questionnaire. The CVM is generally applied in the willingness to pay version (WTP), where the respondent is asked how much s/he is willing to pay for a certain change in crowding (Cicchetti and Smith, 1973). More specifically the WTP, for a project which reduces crowding, represents the value of the avoided loss of utility due to overcrowding. Nevertheless it can also be applied in the value of enjoyment (VOE) version\(^2\). In this CVM version the evaluation question asks respondents the value of enjoyment (dissatisfaction) of a change in the daily number of visitors. Compared with the WTP version, the VOE version has

\(^2\) The VOE method have been applied by Penning - Rowsell et al. (1992) for estimating the use value of British beaches. With the same purpose, in Italy this method has been used by Marzetti and Zanuttigh (2003), and Marzetti and Lamberti (2004).
the advantage that no payment vehicle, which might be unpopular, is specified; so the number of protest answers may be lower\(^3\).

The CVM (in whichever version) permits an estimate of the value of the individual preferences about crowding, which depends on a number of variables. A model of resident’s/visitor’s satisfaction (dissatisfaction) is as follows:

\[
U = r (Q, C, A, L, R, S, I),
\]

where: \(U\) = individual satisfaction (utility); \(Q\) = daily number of visitors; \(C\) = crowding consequences (advantages and disadvantages); \(A\) = a vector of site attributes, such as infrastructure capacity and facilities; \(L\) = factors representing individual quality of life; \(R\) = reactions to overcrowding; \(S\) = socio-economic attributes, such as total household income per year, sex, age, education, employment, marital status; \(I\) = survey influences, such as interviewer characteristics. Taking other variables as constant, it is expected that the resident or visitor relation between \(U\) and \(Q\) is represented by an individual utility curve such as one of those indicated in figure 1.

Guidelines for the specification of model (2) cannot be provided by the economic theory. Validity and reliability of the survey results are, in general, tested by correlation and regression analysis, and extensive literature exists on this topic (see Bateman and Willis, 1999, for example).

### 3.2. The site SCC: a maximisation model

The site SCC is obtained by comparing the visitors’ SCC, which we indicate with \(Q^*\), with the residents’ SCC, indicated with \(Q^{**}\). It may be the result of a compromise between these two carrying capacities, which is reached by the mediation of the local policy-maker responsible for the sustainable management of the site. In general, three situations are possible:

a) \(Q^* = Q^{**}\), which is the ideal situation because it is a social equilibrium and only one indicator represents the SCC.

b) \(Q^* < Q^{**}\), which indicates that visitors reach the maximum utility before residents. This can be the result of an inadequate quality of tourist services or a lack of adequate infrastructures and facilities. The policy-maker’s action could be promoting the organisation of crowd-attracting activities, and building (or improving) infrastructures and facilities.

c) \(Q^* > Q^{**}\), where residents reach the maximum utility before visitors. Our attention is on this last case. It represents a situation of congestion, quite frequent in mass tourism sites, which we model in the following way.

The task of policy-makers is pursuing social welfare. Local policy-makers are elected by residents not by visitors, and they identify the social welfare with residents’ welfare. Therefore, in this essay we consider that in the local political context visitors’ interests are represented by those residents who produce tourist services (the tourist offer)\(^4\). We distinguish three kinds of residents: i) those who are directly and wholly tourism-dependent (the local tourist sector), and who represent visitors’ needs, ii) those who are in part indirectly tourism-dependent (such as those who benefit from the fact that a well developed tourist sector increases the local economic welfare), and iii) those who are totally independent from tourism (such as those who work in the public administration or pensioners). In addition, for simplicity, we suppose that residents who belong to category i) do not feel irritated by the presence of tourists; while those who belong to categories ii) and iii) suffer a loss of enjoyment in overcrowded situations due to tourism.

---

\(^3\) In particular, if survey studies describe scenarios that respondents find unclear or unrealistic, or are based on relatively small samples, the estimates obtained could differ widely from the true value; therefore great attention has to be paid to these last two aspects.

\(^4\) Canestrelli and Costa (1991, p. 298) highlight that the WTP of tourists ‘can be easily translated’ into the incomes of the ‘tourist-dependent population’.
Supposing that valid and reliable estimates of the monetary value of the utility losses due to crowding are available, we specify two aggregated utility functions about residents: i) the utility function of residents wholly dependent on tourism; and ii) the utility function of partially or totally independent residents. Thus we suppose that the optimum number of visitors tolerated by fully dependent residents is obtained by maximising their aggregated utility curve. This optimum number represents not only their own SCC but also the visitors’ SCC, and for simplicity we refer to it as the visitors’ SCC. Instead, the residents’ SCC is for simplicity assumed to be the optimum number of visitors which maximises the utility function of partially or wholly independent residents.

An aggregation procedure assumes that all individuals are alike and have the sample mean characteristics, such as the sample mean income (Cicchetti and Smith, 1973). Let us assume, for simplicity, that the local tourist sector is a perfect competition market which offers a basket of tourist goods (such as recreational activities and accommodation) per visitor at the price \( p \). The representative wholly tourism-dependent resident does not suffer from crowding and maximises her/his utility \( U_1 \). Utility depends on income \( y_1 \), and for simplicity we write \( U_1(y_1) = y_1 \). We consider \( y_1 = pQ - C(Q) \), where \( C(Q) \) is the production cost, \( Q \) the tourist production measured in number of visitors per day. The optimal problem of this representative wholly tourism-dependent resident is:

\[
\max_Q \ [U_1(y_1) = pQ - C(Q)]. \tag{3}
\]

The first order condition is:

\[
p = C'(Q), \tag{4}
\]

where \( C'(Q) \) is the first order derivative of \( C(Q) \), which for simplicity we assume to increase with \( Q \). The solution is the tourist offer:

\[
Q^* = h(p). \tag{5}
\]

As regards the ii) and iii) categories of residents we use the following model. Their individual utility is \( U_2(y_2) = y_2 \), where income \( y_2 \) is equal to the sum of the non-tourism income \( y_0 \) and the tourism-dependent income \( a(pQ - C(Q)) \), where \( 0 \leq a < 1 \). When \( a=0 \), it means that a resident is wholly tourism-independent. In addition, their social loss of utility due to crowding is \( C_s(Q) \). Therefore, the optimal problem of the representative resident who partially depends or is wholly independent of tourism is:

\[
\max_Q \ [U_2(y_2) - C_s(Q) \equiv y_0 + a(pQ - C(Q)) - C_s(Q)]. \tag{6}
\]

The first order condition is:

\[
p = C'(Q) + C_s'(Q)/a, \tag{7}
\]

where \( C_s'(Q) \) is assumed to increase with \( Q^5 \). The solution can be written:

\[
Q^{**} = f(p). \tag{8}
\]

\(^5\) The utility function \( U \), described in figure 1, is consistent with the residents’ utility here defined. In fact, by assuming the marginal costs to be linearly increasing, it follows that \( U \) is strictly convex since \( U'' \) is negative being \( a > 0 \). In the more general case, the requirement is that \( C_s''(Q) > 0 \) and \( C'(Q) > 0 \).
According to equation (5), given the price \( p \), \( Q \) depends on the ratio between the marginal utility loss due to crowding and the coefficient of tourism benefit \( a \). If there is no loss due to overcrowding, \( C_s'(Q)/a = 0 \), and \( Q^* \) is equal to \( Q^{**} \); while when \( C_s'(Q)/a > 0 \), \( Q^{**} < Q^* \). In other terms, when the utility loss \( C_s'(Q)/a > 0 \), the maximum number of visitors tolerated by partially or wholly tourism-independent residents is lower than that claimed by wholly tourism-dependent residents (or by visitors themselves). In this situation it is a policy-maker's task to mediate between them.

Let us assume that a policy-maker wants to know the number of visitors which maximises the social welfare, here intended as the sum of all residents’ utilities:

\[
\max_Q \{ U_1(y_1) + U_2(y_2) - C_s(Q) \equiv (pQ - C(Q)) + [y_0 + a(pQ - C(Q)) - C_s(Q)] \}.
\] (9)

The first order condition is:

\[
p = C'(Q) + C_s'(Q)\left(\frac{1}{1+a}\right),
\] (10)

and we write

\[
Q^o = g(p).
\] (11)

At the price \( p \), \( Q^o \) represents the ideal site SCC. It is between \( Q^* \) and \( Q^{**} \) because \( C_s'(Q)/ (1+a) < C_s'(Q)/a \), as shown in figure 2 (by assuming the marginal cost to be linear in \( Q \)).

According to equation (10), the price \( p \) is the social price of the tourist basket because it is comprehensive of the social cost due to crowding.

In order to pursue a sustainable management of the tourist resort, let us finally assume that a policy-maker decides to internalise the social loss due to crowding by taxing the tourist sector. According to our model, we can write \( \tau = C_s'(Q)/(1+a) \), where \( \tau \) is a Pigouvian tax; so \( \tau Q^o \) is the total tax that the tourist sector should pay the policy-maker. In figure 2 the tax amount \( \tau \) is equal to BC.

4. Social Carrying Capacity: the Voting Criterion
According to our model, the MNV which represents the ideal site SCC is obtained by maximising the local social welfare. From the practical point of view, if this model is to be useful, individual preferences have to be known. As regards the visitors’ SCC, the optimum $Q^*$ can be estimated because the economic variables $p$ and $a$, and the $C'(Q)$ economic function are known to the policy-maker. Nevertheless, experience shows that a CVM survey is not always successful, and in this case the estimate of the actual preferences represented by the $C,(Q)$ social function is not always possible. More specifically, a respondent may declare that s/he is unable to reply to the valuation questions, or may behave like a “free-rider”\(^6\). If the number of no responses and protest answers is high, it is not possible to estimate the aggregated utility curve of residents\(^7\), and it is not possible to estimate the site SCC through a CBA model. Therefore $Q^{**}$ has to be estimated by some other method.

A different method for estimating $Q^{**}$ is by directly asking residents, partially or wholly tourism-independent, the MNV tolerated on the site considered, by means of a survey by questionnaire. We call this method a MNV survey in order to distinguish it from a CVM survey. Experience shows that residents generally have no problem in establishing the MNV tolerated on the site considered (Severiades, 2000; Medoro, 2004-5). More specifically, through this method, no questions are asked about the monetary value of the respondent’s satisfaction (dissatisfaction) due to crowding. Making reference to the most crowded days of the year, respondents are asked if they would prefer a daily number of visitors greater or lower than those present on the site so as not to feel irritated, or if they prefer the same number. In addition they are asked how comfortable (uncomfortable) they feel about the number of visitors present on the site considered, and their reaction to overcrowding.

The passage from the individual MNV tolerated to the SCC requires the specification of a criterion of social choice. The closest substitute for the maximisation criterion is a voting rule. Different voting rules exist for social deliberations. The majority rule\(^8\) is generally used for social choices. In politics the majority rule is applied to results obtained by the universal suffrage; while here this rule is applied to the results of a less costly survey based on a representative random sample of the relevant population (Marzetti and Mosetti, 2004). In order to distinguish this method from that of the CBA, we call it the majority rule method (MRM).

As regards the general management of social goods, Bowen (1943, p.33) discusses - when preferences are unknown - the ‘possible use of voting as a means of measuring or inferring marginal rates of substitution and hence of determining ideal output’, and highlights the conditions under which the ideal or optimum output of a social good obtained by a maximisation utility model is equal to the output preferred by the majority of voters. As regards the specific social losses due to overcrowding we highlight that, if it is assumed that each resident, partially or wholly tourism-independent, declares as MNV tolerated the number corresponding to her/his maximum net satisfaction, the optimum number of visitors obtained by maximising their utility is equal to the MNV obtained with the MRM even if respondents are unable to establish the monetary value of their satisfaction.

\(^6\) Some respondents may give a false response or no response to the evaluation questions if they fear that they will be asked to pay for the good under evaluation, even when assured that no payment will be asked.

\(^7\) In addition, even if a main survey of at least 500-600 interviews is carried out in order to estimate values with a confidence level of at least 95%, some coefficients – important from the economic point of view - may be statistically non-significant. Furthermore, even where most coefficients are statistically significant, the overall explanatory power of the relationship considered may be quite low. Finally, some simplifications might be needed for aggregating the individual preferences in a social utility function (Bowen, 1943; Cicchetti and Smith, 1973; Mueller, 1979).

\(^8\) Rawls (1971, revised 1999, p.313) claims that the best available way of ensuring ‘just and effective’ choices is some form of majority rule.
Therefore, in order to establish the site SCC, when $Q^* > Q^{**}$ and $C_s'(Q)$ cannot be estimated through a CVM survey, a policy-maker - aiming to internalise the residents’ social loss caused by the tourist sector - is rationally limited by the fact that the monetary values of the utility loss due to crowding is unknown. More specifically, as regards the social function $C'(Q) + C_s'(Q)/a$, only the point A in figure 2 is known because $Q^{**}$ is obtained through the MRM. In the case of linearly increasing marginal costs, as assumed in the model presented in section 3.2 it is easy to show that the ideal site SCC $Q^0$ and the optimal amount of the Pigouvian tax $\tau$ can be computed.

6. Conclusions

In this essay two methods for measuring the SCC are presented: the cost-benefit analysis and the voting rule method. They are based on two different criteria of choice of the MNV tolerated in crowded situations. The CBA is based on the maximisation criterion, and the SCC is computed by considering the individual preferences. The voting rule method is based on the majority voting rule as procedure for obtaining a social preference when individual preferences cannot be estimated. The use of one method rather than the other depends on the data available about the individual preferences.

Assuming that individual preferences about crowding are known, and that the residents’ SCC is the limiting factor, we have presented a CBA model in which the site SCC is the result of a compromise between the residents’ and visitors’ SCCs. In order to internalise the social losses due to crowding, this model permits the computation of the Pigouvian tax.

The ideal situation is to know the monetary value of the individual preferences. Nevertheless experience shows that, if residents generally have no problem in establishing the MNV tolerated on the site, many of them instead may be incapable of eliciting a monetary value for the correspondent utility. In this case, the MNV tolerated is established by applying the MRM. Through this method, partially or wholly tourism-independent residents are directly asked the MNV tolerated, and the residents’ SCC is the MNV tolerated by the majority of them. When marginal social costs are linearly increasing and under certain conditions, the optimum number of visitors, obtained through a maximisation model, is equal to the MNV tolerated by the majority of voters.

References


NOTE DI LAVORO DELLA FONDAZIONE ENI ENRICO MATTEI
Fondazione Eni Enrico Mattei Working Paper Series

Our Note di Lavoro are available on the Internet at the following addresses:
http://www.feem.it/Feem/Pub/Publications/WPapers/default.html
http://www.repec.org

NOTE DI LAVORO PUBLISHED IN 2004

IEM 1.2004 Anil MARKANDYA, Suzette PEDROSO and Alexander GOLUB: Empirical Analysis of National Income and So2 Emissions in Selected European Countries
ETA 2.2004 Masahiko FUJITA and Shlomo WEBER: Strategic Immigration Policies and Welfare in Heterogeneous Countries
PRA 3.2004 Adolfo DI CARLUCCIO, Giovanni FERRI, Cecilia FRALE and Ottavio RICCHI: Do Privatizations Boost Household Shareholding? Evidence from Italy
ETA 4.2004 Victor GINSBURGH and Shlomo WEBER: Languages Disenfranchisement in the European Union
PRA 7.2004 Sandro BRUSCO, Giuseppe LOPOMO and S. VISWANATHAN (lxv): Merger Mechanisms
PRA 8.2004 Wolfgang AUSSENEGG, Pegaret PICHLER and Alex STOMPER (lxv): IPO Pricing with Bookbuilding, and a When-Issued Market
PRA 9.2004 Pegaret PICHLER and Alex STOMPER (lxv): Primary Market Design: Direct Mechanisms and Markets
PRA 11.2004 Bjarne BRENDSTRUP and Harry J. PAARSCH (lxv): Nonparametric Identification and Estimation of Multi-Unit, Sequential, Oral, Ascending-Price Auctions With Asymmetric Bidders
PRA 12.2004 Ohad KADAN (lxv): Equilibrium in the Two Player, k-Double Auction with Affiliated Private Values
PRA 13.2004 Maarten C.W. JANSSEN (lxv): Auctions as Coordination Devices
PRA 14.2004 Gadi FIBICH, Arieh GAVIOUS and Aner SELA (lxv): All-Pay Auctions with Weakly Risk-Averse Buyers
PRA 15.2004 Orly SADE, Charles SCHNITZLEIN and Jaime F. ZENDER (lxv): Competition and Cooperation in Divisible Good Auctions: An Experimental Examination
CCMP 16.2004 Marta STRYSZOWSKA (lxvi): Late and Multiple Bidding in Competing Second Price Internet Auctions
NRM 17.2004 Slim Ben YOUSSEF: Country Risk Ratings of Small Island Tourism Economies
NRM 18.2004 Angela ANTOCI, Simone BORGHESI and Paolo RUSSU (lxvi): Biodiversity and Economic Growth: Stabilization Versus Preservation of the Ecological Dynamics
SIEV 19.2004 Anna ALBERINI, Paolo ROSATO, Alberto LONGO and Valentina ZANATTA: Information and Willingness to Pay in a Contingent Valuation Study: The Value of S. Erasmo in the Lagoon of Venice
NRM 21.2004 Jacqueline M. HAMILTON (lxvii): Climate and the Destination Choice of German Tourists
NRM 23.2004 Pius ODUNGA and Henk FOLMER (lxvii): Profiling Tourists for Balanced Utilization of Tourism-Based Resources in Kenya
NRM 24.2004 Jean-Jacques NOWAK, Mondher SAHLI and Pasquale M. SGRO (lxvii): Tourism, Trade and Domestic Welfare
NRM 26.2004 Juan Luis EUGENIO-MARTÍN, Noelia MARTÍN MORALES and Riccardo SCARPA (lxvii): Tourism and Economic Growth in Latin American Countries: A Panel Data Approach
NRM 27.2004 Raúl Hernández MARTÍN (lxvii): Impact of Tourism Consumption on GDP. The Role of Imports
NRM 29.2004 Marian WEBER (lxviii): Assessing the Effectiveness of Tradable Landuse Rights for Biodiversity Conservation: an Application to Canada’s Boreal Mixedwood Forest
NRM 30.2004 Trond BJORNDAL, Phoebe KOUNDOURI and Sean PASCOE (lxviii): Output Substitution in Multi-Species Trawl Fisheries: Implications for Quota Setting
CTN 33.2004 Wilson PEREZ: Divide and Conquer: Noisy Communication in Networks, Power, and Wealth Distribution
KTHC 36.2004  
KTHC 37.2004  
KTHC 38.2004  
ETA 39.2004  
PRA 40.2004  
CCMP 41.2004  
KTHC 42.2004  
CTN 43.2004  
CTN 44.2004  
NRM 45.2004  
NRM 46.2004  
NRM 47.2004  
NRM 48.2004  
NRM 49.2004  
CTN 51.2004  
GG 50.2004  
NRM 52.2004  
SIEV 53.2004  
NRM 54.2004  
GG 55.2004  
SIEV 56.2004  
CCMP 57.2004  
CCMP 58.2004  
NRM 59.2004  
NRM 60.2004  
CCMP 61.2004  
CCMP 62.2004  
NRM 63.2004  
NRM 64.2004  
NRM 65.2004  
ETA 66.2004  
GG 67.2004  
GG 68.2004  
NRM 69.2004  
CTN 70.2004  
IEM 71.2004  
IEM 72.2004  
SIEV 73.2004  

Franca ECKERT COEN and Claudio ROSSI (lxviii): Foreigners, Immigrants, Host Cities: The Policies of Multi-Ethnicity in Rome. Reading Governance in a Local Context
Kiflemariam HAMDE (lxviii): Mind in Africa, Body in Europe: The Struggle for Maintaining and Transforming Cultural Identity - A Note from the Experience of Eritrean Immigrants in Stockholm
Alberto CAVALIERE: Price Competition with Information Disparities in a Vertically Differentiated Duopoly
Andrea BIGANO and Stef PROOST: The Opening of the European Electricity Market and Environmental Policy: Does the Degree of Competition Matter?
Michael FINUS (lxix): International Cooperation to Resolve International Pollution Problems
Francesco CRESPI: Notes on the Determinants of Innovation: A Multi-Perspective Analysis
Sergio CURRARINI and Marco MARINI: Coalition Formation in Games without Synergies
Marc ESCRIBUÉLA-VILLAR: Cartel Sustainability and Cartel Stability
Sebastian BEROYETS and Nicolas GRAVEL (lxvii): Appraising Diversity with an Ordinal Notion of Similarity: An Axiomatic Approach
Signe ANTHON and Bo JELLESMARK THORSEN (lxvi): Optimal Afforestation Contracts with Asymmetric Information on Private Environmental Benefits
Ekin BIROL, Agnes GYOVÁI and Melinda SMALE (lxvi): Using a Choice Experiment to Value Agricultural Biodiversity on Hungarian Small Farms: Agri-Environmental Policies in a Transition al Economy
Gernot KLEPPER and Sonja PETERSON: The EU Emissions Trading Scheme: Allowance Prices, Trade Flows, Competitiveness Effects
Scott BARRETT and Michael HOEL: Optimal Disease Eradication
Peter BORM, Ruud HENDRICKX and Shao CHIN SUNG: Simple Priorities and Core Stability in Hedonic Games
Anna ALBERINI, Maureen CROPPER, Alan KRUPNICK and Nathalie B. SIMON: Willingness to Pay for Mortality Risk Reductions: Does Latency Matter?
Ingo BRÄUER and Rainer MARGGRAF (lxvi): Valuation of Ecosystem Services Provided by Biodiversity Conservation: An Integrated Hydrological and Economic Model to Value the Enhanced Nitrogen Retention in Renatured Streams
Timo GOESCHL and Tun LIN (lxvi): Biodiversity Conservation on Private Lands: Information Problems and Regulatory Choices
Tom DEDEURWAERDERE (lxvi): Bioprospection: From the Economics of Contracts to Reflexive Governance
Katrin REHDANZ and David MADDISON: The Ametry Value of Climate to German Households
Koen SMEKENS and Bob VAN DER ZWAAN: Environmental Externalities of Geological Carbon Sequestration Effects on Energy Scenarios
Valentina BOSETTI, Mariaeter CASSINELLI and Alessandro LANZA (lxvii): Using Data Envelopment Analysis to Evaluate Environmentally Conscious Tourism Management
Timo GOESCHL and Danilo CAMARGO IGLOI (lxvi): Property Rights Conservation and Development: An Analysis of Extractive Reserves in the Brazilian Amazon
Barbara BUCHNER and Carlo CARRARO: Economic and Environmental Effectiveness of a Technology-based Climate Protocol
Elissaios PAPYRAKIS and Reyer GERLAGH: Resource-Abundance and Economic Growth in the U.S.
Györgyi BELA, György PATAKI, Melinda SMALE and Mariann HAJDÚ (lxvi): Conserving Crop Genetic Resources on Smallholder Farms in Hungary: Institutional Analysis
E.C.M. RUIJGROK and E.E.M. NILLESEN (lxvi): The Socio-Economic Value of Natural Riverbanks in the Netherlands
Giannis VARDAS and Anastasios XEPAPAIDES: Uncertainty Aversion, Robust Control and Asset Holdings
Anastasios XEPAPADEAS and Constadina PASSA: Participation in and Compliance with Public Voluntary Environmental Programs: An Evolutionary Approach
Michael FINUS: Modesty Pays: Sometimes!
Trond BJØRNDAHL and Ana BRASÃO: The Northern Atlantic Bluefin Tuna Fisheries: Management and Policy Implications
Alejandro CAPARRÓS, Abdelhakim HAMMOUDI and Tarik TAZDAÏT: On Coalition Formation with Heterogeneous Agents
Massimo GIOVANNINI, Margherita GRASSO, Alessandro LANZA and Matteo MANERA: Conditional Correlations in the Returns on Oil Companies Stock Prices and Their Determinants
Alessandro LANZA, Matteo MANERA and Michael MCALEER: Modelling Dynamic Conditional Correlations in WTI Oil Forward and Futures Returns
Margherita GENIUS and Elisabetta STRAZZERA: The Copula Approach to Sample Selection Modelling: An Application to the Recreational Value of Forests
Price Sealed-Bid Auctions
Maximization and the Multiple-Good Monopoly

the Incidence of Commissions in Auction Markets
and Evidence from Timber Auctions

Externalities
in Stabilization Policies?

Bookbuilding is Dominating Auctions

Real Option Analysis

Č.
Herbert DAWID, Christophe DEISSENBERG and Pavel ŠEV

Influence of World Energy Prices

Santiago J. RUBIO

for Public Goods: Finite Versus Continuous Mixing in Logit Models

Latent-Class Approach Based on Intensity of Participation

Savings
Analysis of Climate Change Impacts on Tourism

from Poland and the Czech Republic

Alberto PETRUCCI

: Asset Accumulation, Fertility Choice and Nondegenerate Dynamics in a Small Open Economy

NRM
122.2004

Carlo GIUPPONI, Jaroslav MYSIAK and Anita FASSIO: An Integrated Assessment Framework for Water Resources Management: A DSS Tool and a Pilot Study Application


Paul MENSINK: Instant Efficient Pollution Abatement Under Non-Linear Taxation and Asymmetric Information: The Differential Tax Revisited

Mauro FABIANO, Gabriella CAMARSA, Rosanna DURSI, Roberta VALDI, Valentina MARIN and Francesca PALMISANI: Integrated Environmental Study for Beach Management: A Methodological Approach

Irena GROSFELD and Iraj HASHI: The Emergence of Large Shareholders in Mass Privatized Firms: Evidence from Poland and the Czech Republic

Maria BERRITELLA, Andrea BIGANO, Roberto ROSON and Richard S.J. TOL: A General Equilibrium Analysis of Climate Change Impacts on Tourism

Reyer GERLAGH: A Climate-Change Policy Induced Shift from Innovations in Energy Production to Energy Savings

Elisavet PAPYRKIS and Reyer GERLAGH: Natural Resources, Innovation, and Growth

Bernardo BORTOLOTTI and Mara FACCIO: Reluctant Privatization

Riccardo SCARPA and Mara THIENE: Destination Choice Models for Rock Climbing in the Northeast Alps: A Latent-Class Approach Based on Intensity of Participation


Savings
Sight J. RUBIO: On Capturing Oil Rents with a National Excise Tax Revisited

Ascensiön ANDINA DÍAZ: Political Competition when Media Create Candidates’ Charisma

Anna ALBERINI: Robustness of VSL Values from Contingent Valuation Surveys

Maria CARRONI: Reluctant Privatization

Chiara D’ALPAOS and Michele MORETTO: The Value of Flexibility in the Italian Water Service Sector: A Latent-Class Approach Based on Intensity of Participation

Gernor KLEPPER and Sonja PETERSON: Marginal Abatement Cost Curves in General Equilibrium: The Influence of World Energy Prices

Herbert DAWID, Christophe DEISSENBERG and Pavel ŠEVČIK: Cheap Talk, Gullibility, and Welfare in an Environmental Taxation Game

ZhongXiang ZHANG: The World Bank’s Prototype Carbon Fund and China

Chunhui WANG and Reyer GERLAGH: A New Approach to Assessing the Climate Change Stabilization Policy

Chiara D’ALPAOS and Michele MORETTO: The Value of Flexibility in the Italian Water Service Sector: A Latent-Class Approach Based on Intensity of Participation


Victor GINSBURGH, Patrick LEGROS and Nicolas SAHUGUET: Quid Pro Quo in IPOs: Why

Vitor GINSBURGH, Patrick LEGROS and Nicolas SAHUGUET: How to Win Twice at an Auction. On the Incidence of Commissions in Auction Markets

Claudio MEZZETTI, Aleksandar PEKEK and Ilia TSETLIN: Sequential vs. Single-Round Uniform-Price Auctions

John ASKER and Estelle CANTILLON: The Political Economy of Auction Auctions

Philip A. HAILE, Han HONG and Matthew SHUM: On Common Values in First-Price Sealed-Bid Auctions

Bernard BORTOLOTTI and Mara FACCIO: Quid Pro Quo in IPOs: Why

Maria BERRITELLA, Andrea BIGANO, Roberto ROSON and Richard S.J. TOL: A General Equilibrium Analysis of Climate Change Impacts on Tourism

Reyer GERLAGH: A Climate-Change Policy Induced Shift from Innovations in Energy Production to Energy Savings

Elisavet PAPYRKIS and Reyer GERLAGH: Natural Resources, Innovation, and Growth

Bernardo BORTOLOTTI and Mara FACCIO: Reluctant Privatization

Riccardo SCARPA and Mara THIENE: Destination Choice Models for Rock Climbing in the Northeast Alps: A Latent-Class Approach Based on Intensity of Participation


Savings
Sight J. RUBIO: On Capturing Oil Rents with a National Excise Tax Revisited

Ascensiön ANDINA DÍAZ: Political Competition when Media Create Candidates’ Charisma

Anna ALBERINI: Robustness of VSL Values from Contingent Valuation Surveys

Maria CARRONI: Reluctant Privatization

Chiara D’ALPAOS and Michele MORETTO: The Value of Flexibility in the Italian Water Service Sector: A Latent-Class Approach Based on Intensity of Participation

Gernor KLEPPER and Sonja PETERSON: Marginal Abatement Cost Curves in General Equilibrium: The Influence of World Energy Prices

Herbert DAWID, Christophe DEISSENBERG and Pavel ŠEVČIK: Cheap Talk, Gullibility, and Welfare in an Environmental Taxation Game

ZhongXiang ZHANG: The World Bank’s Prototype Carbon Fund and China

Chunhui WANG and Reyer GERLAGH: A New Approach to Assessing the Climate Change Stabilization Policy

Chiara D’ALPAOS and Michele MORETTO: The Value of Flexibility in the Italian Water Service Sector: A Latent-Class Approach Based on Intensity of Participation
NOTE DI LAVORO PUBLISHED IN 2005

CCMP 1.2005  Stéphane HALLEGATTE: Accounting for Extreme Events in the Economic Assessment of Climate Change

CCMP 2.2005  Qiang WU and Paulo Augusto NUNES: Application of Technological Control Measures on Vehicle Pollution: A Cost-Benefit Analysis in China

CCMP 3.2005  Andrea BIGANO, Jacqueline M. HAMILTON, Maren LAU, Richard S.J. TOL and Yuan ZHOU: A Global Database of Domestic and International Tourist Numbers at National and Subnational Level

CCMP 4.2005  Andrea BIGANO, Jacqueline M. HAMILTON and Richard S.J. TOL: The Impact of Climate on Holiday Destination Choice

ETA 5.2005  Hubert KEMPF: Is Inequality Harmful for the Environment in a Growing Economy?


CCMP 9.2005  Angelo ANTOCCI: Environmental Resources Depletion and Interplay Between Negative and Positive Externalities in a Growth Model

CTN 10.2005  Frédéric DEROIAN: Cost-Reducing Alliances and Local Spillovers

NRM 11.2005  Francesco SINDICO: The GMO Dispute before the WTO: Legal Implications for the Trade and Environment Debate


PRCG 14.2005  Clara GRAZIANO and Annalisa LUPORINI: Ownership Concentration, Monitoring and Optimal Board Structure

CSRMI 15.2005  Parashar KULKARNI: Use of Ecolabels in Promoting Exports from Developing Countries to Developed Countries: Lessons from the Indian LeatherFootwear Industry

KTHC 16.2005  Adriana DI LIBERTO, Roberto MURA and Francesco PIGLIARU: How to Measure the Unobservable: A Panel Technique for the Analysis of TFP Convergence

KTHC 17.2005  Alireza NAGHAVI: Asymmetric Labor Markets, Southern Wages, and the Location of Firms

KTHC 18.2005  Alireza NAGHAVI: Strategic Intellectual Property Rights Policy and North-South Technology Transfer

KTHC 19.2005  Mombert HOPPE: Technology Transfer Through Trade

PRCG 20.2005  Roberto ROSON: Platform Competition with Endogenous Multithoming

CCMP 21.2005  Barbara BUCHNER and Carlo CARRARO: Regional and Sub-Global Climate Blocs. A Game Theoretic Perspective on Bottom-up Climate Regimes


CTN 23.2005  Michael FINUS, Pierre v. MOUCHE and Bianca RUNDSHAGEN: Uniqueness of Coalitional Equilibria


SIEV 26.2005  Massimiliano MAZZANTI and Anna MONTINI: The Determinants of Residential Water Demand Empirical Evidence for a Panel of Italian Municipalities

CCMP 27.2005  Laurent GILOTTE and Michel de LARA: Precautionary Effect and Variations of the Value of Information

NRM 29.2005  Paul SARFO-MENSAH: Exportation of Timber in Ghana: The Menace of Illegal Logging Operations

CCMP 30.2005  Andrea BIGANO, Alessandra GORIA, Jacqueline HAMILTON and Richard S.J. TOL: The Effect of Climate Change and Extreme Weather Events on Tourism

NRM 31.2005  Maria Angeles GARCIA-VALINAS: Decentralization and Environment: An Application to Water Policies

NRM 32.2005  Chiara D’ALPAOS, Cesare DOSI and Michele MORETTO: Concession Length and Investment Timing Flexibility

CCMP 33.2005  Joseph HUBER: Key Environmental Innovations

CTN 34.2005  Antoni CALVÓ-ARMENGOL and Rahmi ILKILIÇ (lxxii): Pairwise-Stability and Nash Equilibria in Network Formation

CTN 35.2005  Francesco FERI (lxxii): Network Formation with Endogenous Decay

CTN 36.2005  Frank H. PAGE, Jr. and Myrna H. WOODERS (lxxii): Strategic Basins of Attraction, the Farsighted Core, and Network Formation Games
Carlo CARRARO, Carmen MARCHIORI and Alessandra SGOBBI

Abnormal Returns in Privatization Public Offerings: The Case of Portuguese Firms

CTN

Exploiting the Value of Non-Marketable Sports Properties in the Lagoon of Venice

IEM

Varieties of Trust

KTHC


KTHC

Applications of Negotiation Theory to Water Issues

CTN

Advances in Negotiation Theory: Bargaining, Coalitions and Fairness

KTHC

Network Capital and Social Trust: Pre-Conditions for ‘Good’ Diversity?

CCMP

A Data Envelopment Analysis Approach to the Assessment of Natural Parks’ Economic Efficiency and Sustainability. The Case of Italian National Parks

ETA

Investment and the Play of Finitely Repeated Games

IEM

Varieties of Trust in International Environmental Agreements

KTHC

Criteria for Assessing Sustainable Innovations: Institutional Impacts on Co-operations for Sustainable Development

SIEV

Discount Rates or Impact Scores: A Risk-Return Model of Social Capital

PRCG

The Value of Sports Fishing in the Lagoon of Venice: Results from a Dose-Response-Model

SIEV

Economic Valuation of On Site Material Damages of High Water on Economic Activities based in the City of Venice: Results from a Dose-Response-Expert-Based Valuation Approach

SIEV

Combining Actual and Contingent Behavior to Estimate the Value of Sports Fishing in the Lagoon of Venice

NRM

Role of Timing and Regulation in the Doha Proposal: Are EU Environmental Policies Too Demanding for New Members States?

OFT

Environmental Po...
Travel Cost Method Study

Preventing Environmental Damage

Benno TORGLER and Maria A. GARCIA-VALIÑAS

of Milan

Learning and Salience

Capacity to Climate Change: Evidence from a Conjoint Choice Survey

the Italians Willing to Pay to Reduce Their Risks?

Ate? Implementation of the FDA Seafood HACCP Program

Indicators for the Analysis of Mobility Impact in Italy

Coalitions in the Agricultural Negotiations of the Doha Round: Similarity of Interests or Strategic Choices?

Likelihood of an International Climate Agreement

Implications of Climate Change: Human Health

Formation in Economic-Ecological Models

William BROCK and Anastasios XEPAPADEAS

Players

Auctions: Evidence from ECB Open Market Operations

Valentina BOSETTI

Care when Physicians are Devoted Workers

Districts

Efficiency of Different Climate Policy Portfolios

End-of-Life Vehicles European Policies

End-of-Life Vehicles European Policies

Massimiliano MAZZANTI and Roberto ZOBOLI: Economic Instruments and Induced Innovation: The Case of

Valentina BOSETTI and Barbara BUCHNER: Using Data Envelopment Analysis to Assess the Relative

Efficiency of Different Climate Policy Portfolios

IEM 85.2005

Rosella LEVAGGI, Michele MORETTO and Vincenzo REBBA: Quality and Investment Decisions in Hospital

Care when Physicians are Devoted Workers

CCMP 86.2005

Valentina BOSETTI and Laurent GILOTTE: Carbon Capture and Sequestration: How Much Does this Uncertain

Option Affect Near-Term Policy Choices?

CSR 87.2005

Nicoleta FERRO: Value Through Diversity: Microfinance and Islamic Finance and Global Banking

ETA 88.2005

A. MARKANDYA and S. PEDROSO: How Substitutable is Natural Capital?

IE 89.2005

Anil MARKANDYA, Valeria COSTANTINI, Francesco GRACCEVA and Giorgio VICINI: Security of Energy

Supply: Comparing Scenarios From a European Perspective

CCMP 90.2005

Vincent M. OTTO, Andreas LÖSCHEL and Rob DELLINK: Energy Biased Technical Change: A CGE Analysis

PRC 91.05

Carlo CAPUANO: Abuse of Competitive Fringe

PRC 92.05

Ulrich BINDSEIL, Kjell G. NYBOR and Ilya A. STREBULAEV (lxxv): Bidding and Performance in Repo

Auctions: Evidence from ECB Open Market Operations

CCMP 93.05

Sabrina AUCI and Leonardo BECCETTI: The Stability of the Adjusted and Unadjusted Environmental

Kuznets Curve

CCMP 94.05

Francesco BOSELLO and Jian ZHANG: Assessing Climate Change Impacts: Agriculture

CTN 95.05

Alejandro CAPARRÓS, Jean-Christian PEREAU and Tarik TAZDAIT: Bargaining with Non-Monolithic

Players

ETA 96.05

William BROCK and Anastasios XEPAPADEAS (lxxvi): Optimal Control and Spatial Heterogeneity: Pattern

Formation in Economic-Ecological Models

CCMP 97.05

Francesco BOSELLO, Roberto ROSON and Richard S.J. TOL (lxxvii): Economy-Wide Estimates of the

Implications of Climate Change: Human Health

CCMP 98.05

Likelihood of an International Climate Agreement

Valeria COSTANTINI, Riccardo CRESCENZI, Fabrizio De FILIPPIS, and Luca SALVATICI: Bargaining

Coalitions in the Agricultural Negotiations of the Doha Round: Similarity of Interests or Strategic Choices?

An Empirical Assessment

IEM 100.05

Giliola FREY and Matteo MANERA: Econometric Models of Asymmetric Price Transmission

IEM 101.05

Alessandro COLOGNI and Matteo MANERA: Oil Prices, Inflation and Interest Rates in a Structural

Comitted VAR Model for the G-7 Countries

KTHC 102.05

Chiara M. TRAVISI and Roberto CAMAGNI: Sustainability of Urban Sprawl: Environmental-Economic

Indicators for the Analysis of Mobility Impact in Italy

ETA 103.05

Livingstone S. LUBOOBI and Joseph Y.T. MUGISHA: HIV/AIDS Pandemic in Africa: Trends and Challenges

SIEV 104.05

Anna ALBERINI, Erik LICHTENBERG, Dominic MANCINI, and Gregmar I. GALINATO: Was It Something I

Ate? Implementation of the FDA Seafood HACCP Program

SIEV 105.05

Anna ALBERINI and Aline CHIABAI: Urban Environmental Health and Sensitive Populations: How Much are

the Italians Willing to Pay to Reduce Their Risks?

SIEV 106.05

Anna ALBERINI, Aline CHIABAI and Lucia MUEHLENBACHS: Using Expert Judgment to Assess Adaptive

Capacity to Climate Change: Evidence from a Conjoint Choice Survey

CTN 107.05

Michele BERNASCONI and Matteo GALIZI: Coordination in Networks Formation: Experimental Evidence on

Learning and Salience

KTHC 108.05

Michele MORETTO and Sergio VERGALLI: Migration Dynamics

NRM 109.05

Antonio MUSOLESI and Mario NOSVLELI: Water Consumption and Long-Run Urban Development: The Case

of Milan

SIEV 110.05

Benno TORGLER and Maria A. GARCIA-VALIÑAS: The Determinants of Individuals' Attitudes Towards

Preventing Environmental Damage

SIEV 111.05

Alberto LONGO and Anna ALBERINI: What are the Effects of Contamination Risks on Commercial and

Industrial Properties? Evidence from Baltimore, Maryland

SIEV 112.05

Anna ALBERINI and Alberto LONGO: The Value of Cultural Heritage Sites in Armenia: Evidence from a

Travel Cost Method Study

CCMP 113.05

Mikel GONZALEZ and Rob DELLINK: Impact of Climate Policy on the Basque Economy

NRM 114.05

Gilles LAFFORGUE and Wald OUESLATI: Optimal Soil Management and Environmental Policy
<table>
<thead>
<tr>
<th>Series</th>
<th>Title</th>
<th>Editor(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2004 SERIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCMP</td>
<td>Climate Change Modelling and Policy</td>
<td>Marzio Galeotti</td>
</tr>
<tr>
<td>GG</td>
<td>Global Governance</td>
<td>Carlo Carraro</td>
</tr>
<tr>
<td>SIEV</td>
<td>Sustainability Indicators and Environmental Valuation</td>
<td>Anna Alberini</td>
</tr>
<tr>
<td>NRM</td>
<td>Natural Resources Management</td>
<td>Carlo Giupponi</td>
</tr>
<tr>
<td>KTHC</td>
<td>Knowledge, Technology, Human Capital</td>
<td>Gianmarco Ottaviano</td>
</tr>
<tr>
<td>IEM</td>
<td>International Energy Markets</td>
<td>Anil Markandya</td>
</tr>
<tr>
<td>CSRM</td>
<td>Corporate Social Responsibility and Sustainable Management</td>
<td>Sabina Ratti</td>
</tr>
<tr>
<td>PRA</td>
<td>Privatisation, Regulation, Antitrust</td>
<td>Bernardo Bortolotti</td>
</tr>
<tr>
<td>ETA</td>
<td>Economic Theory and Applications</td>
<td>Carlo Carraro</td>
</tr>
<tr>
<td>CTN</td>
<td>Coalition Theory Network</td>
<td></td>
</tr>
<tr>
<td><strong>2005 SERIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CCMP</td>
<td>Climate Change Modelling and Policy</td>
<td>Marzio Galeotti</td>
</tr>
<tr>
<td>SIEV</td>
<td>Sustainability Indicators and Environmental Valuation</td>
<td>Anna Alberini</td>
</tr>
<tr>
<td>NRM</td>
<td>Natural Resources Management</td>
<td>Carlo Giupponi</td>
</tr>
<tr>
<td>KTHC</td>
<td>Knowledge, Technology, Human Capital</td>
<td>Gianmarco Ottaviano</td>
</tr>
<tr>
<td>IEM</td>
<td>International Energy Markets</td>
<td>Anil Markandya</td>
</tr>
<tr>
<td>CSRM</td>
<td>Corporate Social Responsibility and Sustainable Management</td>
<td>Sabina Ratti</td>
</tr>
<tr>
<td>PRCG</td>
<td>Privatisation Regulation Corporate Governance</td>
<td>Bernardo Bortolotti</td>
</tr>
<tr>
<td>ETA</td>
<td>Economic Theory and Applications</td>
<td>Carlo Carraro</td>
</tr>
<tr>
<td>CTN</td>
<td>Coalition Theory Network</td>
<td></td>
</tr>
</tbody>
</table>