Fondazione Eni Enrico Mattei

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

Anna Alberini, Valentina Zanatta and Paolo Rosato

NOTA DI LAVORO 44.2005

MARCH 2005

SIEV – Sustainability Indicators and Environmental Valuation

Anna Alberini, *AREC, University of Maryland, College Park and Fondazione Eni Enrico Mattei*
Valentina Zanatta, *DICAS, Politecnico di Torino and Fondazione Eni Enrico Mattei*
Paolo Rosato, *DIC, Università di Trieste and Fondazione Eni Enrico Mattei*

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

Summary

This paper reports the results of a Travel Cost Method (TCM) study about the recreational use of the Lagoon of Venice for sports fishing. In April-July 2002, we conducted a mail survey of anglers with valid licenses fishing on the Lagoon of Venice to gather data on their fishing trips, behaviors and expenditures over the previous year. We also asked questions about trips that would be undertaken under hypothetical changes in the price of a trip and/or in the catch rate. Actual and hypothetical trips are combined to estimate single-site TCM demand function for trips. We propose several models to test whether it is acceptable to pool hypothetical and actual trip data, focusing on the respondent heterogeneity in the contingent behavior questions. Our models suggest actual and contingent behavior are driven by the same demand function, and can be pooled for estimation purposes. We use this estimated demand function, and its shift when the catch rate is improved, to compute angler surplus at the current catch rate and the change in surplus accruing from a 50% improvement in the catch rate. For the average angler in our sample, the former is about €1,700 a year, while the latter is about €2,800.

Keywords: Sports fishing value, Travel cost method, Environmental improvement

JEL Classification: Q26, Q51

We wish to thank Giuseppe Chiaia of the Province of Venice and Andrea Galvan of FEEM for their valuable help in the survey. This research was funded by a research grant from the Consortium for the Coordination and Management of Research on the Lagoon of Venice (CO.RI.LA.) and by additional research funding from the Province of Venice.

Address for correspondence:

Anna Alberini
AREC, 2200 Symons Hall
University of Maryland
College Park, MD 20742
USA
Phone: 001 301 405-1267
Fax: 001 301 314-9091
E-mail: aalberini@arec.umd.edu

1. Introduction and Background

The Lagoon of Venice is a site of exceptional interest, due to its distinctive hydrological features and ecosystem, and its unique cultural and social significance. As one of the most important wetland sites in the Mediterranean region, the Lagoon of Venice is covered by the European Union's policy for wetlands preservation,[3] and the harvesting of fish and shellfish in the Lagoon is an important local economic activity.

At this time, however, the Lagoon of Venice is environmentally degraded, due to the industrial pollution from plants and refineries in nearby Porto Marghera, nutrient and pesticides in agricultural runoff, and organic pollutants from urban areas and livestock. In addition, overfishing by commercial outfits has depleted fish stocks, and biodiversity is endangered by an exotic clam species that was artificially introduced for commercial fishing during the 1980s. The introduction of the *Tapes philippinarum* clam has been blamed for serious changes in the natural lagoon environment, as harvesting this species involves the use of invasive (and illegal) fishing techniques, such as mechanical scrapers, which were eventually prohibited (Pranovi and Giovanardi [4]; ICRAM [5]).

Public programs are currently under consideration that would seek to restore environmental balance in the Lagoon by reducing pollution and implementing and managing sustainable commercial fishing practices. The latter would result in increased

---

[3] European Community Directive 92/43 "Habitat," on conservation, defense and improvement of environmental quality in sites of European Community interest.

fish stocks. In this paper, we use a combination of the travel cost method (TCM) and contingent behavior questions to estimate the benefits of increasing fish stocks for one category of beneficiaries--recreational anglers.

The TCM is a frequently used approach for estimating the benefits of management policies for natural resource sites and environmental amenities that have recreational use value. The method relies on the variation in the travel costs faced by a sample of potential and actual visitors to the site, which allows one to estimate the demand function for trips at different trip prices.

When the proposed policy calls for improving the quality at the site, to estimate the benefits of such improvements it is necessary to trace out demand for trips to the site for a level of site quality that is not currently observed. To circumvent this problem, in recent studies researchers have asked individuals to tell them how many trips they would take to the site under hypothetical conditions, and have combined the responses to these questions—known as contingent behaviors—with observations on actual trips to the site under the current conditions.

Implicit in this approach is the assumption that actual trips and the responses to the contingent behavior questions are driven by the same preferences. If this assumption is violated, serious doubts arise about the usefulness of contingent behavior questions and on the policy prescriptions based on the responses to these questions.

In this paper we propose and implement several possible approaches to detect any differences between the demand functions implied by actual and contingent behavior trips, focusing on the issue of heterogeneity across respondents in their reactions to contingent behavior questions. We propose two alternative models for heterogeneity—

namely, (i) heterogeneity that is linked with observable individual characteristics, and (ii) unobserved heterogeneity.

Our data suggest that our respondents were comfortable with the hypothetical questions, and that their responses to the contingent behavior questions are consistent with actual behaviors. We find no evidence of a systematic hypothetical bias that would undermine the use of the responses to the hypothetical questions for policy purposes, and no evidence of heterogeneity related to individual characteristics in the response to hypothetical changes in catch rates. Random-coefficients models suggest that heterogeneity, if any, is of an unobserved nature, and confirm that there are no systematic hypothetical question effects.

Earlier research about the difference between hypothetical and actual demand functions has produced mixed results. Some studies (e.g., Rosenberger and Loomis [1]) find no systematic differences between actual and hypothetical trips. Azevedo et al. [2] use state and revealed preference data about trips to wetland resources in Iowa to test four hypotheses about responses to contingent behavior questions, concluding that there are inconsistencies between stated and revealed preference data.

Perhaps the most complete study is that conducted by Grijalva et al. [3], who elicit actual and contingent behavior trips to rock climbing sites in Texas, and compare them with actual trips taken after the proposed policy was implemented. These authors find that post-policy trips are more price sensitive than pre-policy trips, but advise that caution should be used in interpreting this result.

In sum, the contribution of this paper is two-fold. First, we produce estimates of recreational sports fishing values at current and improved catch rates. Second, since we combine actual and hypothetical trips, we propose and estimate formal models of heterogeneity in the response to the hypothetical policy to make sure that actual and hypothetical trips belong to the same demand function. These models nicely supplement conventional ways of testing for differences across actual and hypothetical behaviors, and allow us to conclude that the two types of data can be pooled to estimate the demand for fishing trips at current and improved conditions.

The reminder of this paper is organized as follows. Section II describes the survey design and administration. Section III describes the basic TCM approach and Section IV the econometric model. Section V describes the survey data and section VI presents the estimation results. Section VII reports the welfare variation estimates and section VIII provides concluding remarks.

II. Study Design and Administration

A. Study Design

In April-July 2002, we conducted a mail survey of anglers with valid fishing licenses for the Lagoon of Venice to gather information on their fishing trips to the Lagoon (see Appendix A), and the related expenditures over the previous year. We also asked questions about trips that would be undertaken under hypothetical changes in the price of a trip and in the catch rate. Specifically, we asked them how many trips they would take in a year if the price per trip increased by a specified percentage. This percentage was varied to the respondent, and was selected at random from five possible values (20%, 40%, 60%, 80% and 100%).

Next, we asked respondents how many trips they would take (i) if there was a 50% increase in the catch rate, and (ii) for a simultaneous increase in the price per trip and in the catch rate. This results in a total of four scenarios (current conditions plus three hypothetical situations), for a total of four observations on Lagoon fishing trips for each respondent, as shown in table 1.[4]

The purpose of the hypothetical questions is to (i) refine our information about the demand for trips at the *current* catch rates, and (ii) estimate the shift in the demand curve for trips in the presence of *improved* catch rates. This shift in the demand function is crucial for estimating the benefits of fish stock maintenance to sports anglers.

Because we wanted to make sure that the hypothetical changes in catch rates were acceptable to the respondents, we included in the questionnaire several questions that inquire about the respondent's opinions about and perceptions of environmental quality (pollution) and exotic species (the *Tapes philippinarum* clam) in the Lagoon. We also inquired whether the respondent had previously changed his fishing behavior as a result of such problems.

B. Survey Administration

The survey was administered by mail in April-July 2002. In a first wave of mailings, we sent questionnaires to 3000 anglers. This sample was drawn from the universe of all holders of fishing licenses in the Province of Venice, stratified by distance

---

[4] We therefore have more observations on trips per respondent than many studies published in the literature. Rosenberger and Loomis [1], Azevedo et al. [2] and Hanley et al. [6] for example, only have one actual and one hypothetical observation per respondent.

of the angler's place of residence from the Lagoon and age.[5] The survey packet included a participation notice card, which was filled out and returned by about 500 anglers.

In our second wave of mailings, we sent a reminder card to the remaining 2500 anglers. We received about 500 more participation cards after this reminder. In sum, the participation notice card was filled and returned to us by 1048 anglers. Of these, 605 stated that they did not intend to participate in the survey, while the remaining 443 filled out the questionnaire. Out of the latter 443, 269 had gone fishing in the Venice Lagoon in the previous 12 months. In this paper, attention is restricted to these 269 individuals.

III. The Model

To estimate the value of recreational sports fishing and the welfare change associated with changes in the environmental quality of the Lagoon, we use a single-site TCM of sports fishing in the Lagoon of Venice. The simplest single-site TCM assumes that an individual's utility depends on aggregate consumption, *X*, leisure, *L* and fishing trips, *r*:

(1) $$U = U(X, L, r)$$

The TCM rests on the assumption of weak complementarity between trips and quality at the site, *q*. In other words, $\partial U / \partial q = 0$ if $r = 0$ (the individual does not care about quality at the site if he or she does not visit the site), and *r* is an increasing function of *q*. The individual chooses *X*, *L* and *r* to maximize utility subject to the budget constraint:

[5] Specifically, we created four areas. The first area is the city of Venice, plus the islands of the Lagoon. The second area is comprised of population centers on the boarder of the lagoon. The third area population centers 5 to 10 kilometers from the Lagoon, and the fourth area is comprised of population centers 10 kilometers or more from the Lagoon.

(2) $$y + w \cdot \left[\overline{T} - L - r(t_1 + t_2)\right] = X + (f + P_d \cdot d) \cdot r$$

where y is non-work income, $\overline{T}$ is total time, t_1 is travel time to the site, t_2 is time spent at the site, f is the access fee (if any), P_d is the cost per kilometer, and d is the distance to the fishing site.[6]

This yields the demand function for trips:

(3) $$r^* = r^*(y, w, p_r, q)$$

where $p_r = w(t_1 + t_2) + f + p_d \cdot d$ is the full price of a trip.

In our empirical work, we assume that the demand function is linear in its arguments y, w, p_r, and q. Formally,

(4) $$r^* = \beta_0 + \beta_1 w + \beta_2 p_r + \beta_3 q \,.$$

On appending an error term, equation (4) becomes an econometric model, which we estimate after collecting data on trips, p_r, w, y, and other individual characteristics through our survey of potential and actual Lagoon anglers in the area surrounding Venice.

We have four observations on trips for each respondents, and two sources of variation for p_r and q, which is here the catch rate: (i) across anglers, and (ii) across scenarios within one angler. These sources of variation should be adequate to estimate the slope of the demand function, β_2, and the effect (β_3) of public programs currently under consideration that affect water quality and fish stocks, and hence catch rates.

---

[6] This model further assumes that travel time and time spent at the site are given and exogenous, that there is no utility or disutility from traveling to the site, and that each trip to the site is undertaken for no other purpose than fishing. It also assumes that individuals perceive and respond to changes in travel costs in the same way they would to changes in a fee for being admitted to the site (Freeman, [7]). Finally, the model assumes that work hours are flexible. The model can be easily amended to allow for endogenous travel and visit times, and for fixed work hours.

IV. The Econometric Model

A. Basic Econometric Model and Welfare Calculation

Absent any response effects due to the hypothetical scenario, our regression equation is:

(5) $$TRIPS_{ij} = \mathbf{x}_i\beta + p_{ij}\gamma + catchrate_{ij}\delta + p^A_{ij}\lambda + \varepsilon_{ij}$$

where $i = 1, 2, \ldots, n$ denotes the respondent, and $j = 1, \ldots, 4$ denotes the scenario. *TRIPS* is the number of trips per year, **x** is a vector of individual characteristics, p is the cost per fishing trip, and *catchrate* is catch rate, measured in kilograms of fish caught per trip. P^A is the price per trip to an alternative fishing destination. (It is also useful to define a dummy indicator, $Catch_j$, that takes on a value of one for those scenarios—scenarios 2 and 4—that posit an improved catch rate.) β, γ, δ and λ are unknown coefficients, and ε_{ij} is an error term.[7]

One caveat is in order. The observations on fishing trips under the four scenarios are correlated within an individual if unobservable angler characteristics influence both current fishing trips and the announced number of trips under the hypothetical scenarios. We therefore adopt a random-effects specification, where we assume that $\varepsilon_{ij} = \nu_i + \eta_{ij}$, with ν_i a respondent-specific, zero-mean component, and η_{ij} an i.i.d. error term. ν_i and η_{ij} are uncorrelated with each other, across individuals, and with the regressors in the right-hand side of equation (5). The presence of the individual-specific component of the

[7] As explained below, our respondents reported numerous trips (an average of about 30) to the Lagoon every year, which makes the linear model desirable for this specific application.

error term (ν_i) result in correlated error terms ε within a respondent.[8] This means that the model must be estimated using Generalized Least Squares.[9] [10]

The estimated coefficients are used to calculate two welfare measures. The first captures the value of access and is the consumer surplus associated with current fishing conditions and prices:

(6) $$CS_i(p_{0i}, cr_{0i}) = -\frac{1}{2\gamma}\left[\mathbf{x}_i\beta + p_{0i}\gamma\right]^2.$$

The second captures the value of changes in the quality of the Lagoon of Venice as a fishing site, and is the change in surplus due to an improvement in catch rate (holding the prices the same):

(7) $$\Delta CS_i = CS_i(p_{0i}, cr_{1i}) - CS_i(p_{0i}, cr_{0i}) = -\frac{1}{2\gamma}\left[\delta^2 + 2\delta(\mathbf{x}_i\beta + p_{0i}\gamma)\right].$$

Figure 1 depicts the consumer surplus with and without the improvement in the catch rate, assuming for the sake of simplicity that the catch rate variable in the econometric equation is a dummy. The surplus with the improvement in the catch rate is equal to the area of the triangle AED while the surplus without the improvement is equal to the area BEC. So the improvement in the CS is equal to the area ABCD.

---

[8] Specifically, $E(\varepsilon_{ij}\varepsilon_{ik}) = \sigma_\nu^2$, where σ_ν^2 is the variance of ν, for j≠k, whereas the variance of each ε_{ij} is $\sigma_\nu^2 + \sigma_\eta^2$, where σ_η^2 is the variance of η.

[9] When the price of a trip is raised, some individuals state that they would stop going fishing altogether. We experimented with a tobit model with random effects, and found that its coefficients were virtually identically to those of the linear model with random effects. Given the difficulty of estimating a *random-coefficient* model (see below) superimposed to the tobit equation, in this paper we choose to present the results based on the linear model.

[10] Another application that resulted in the estimation of random-effect models is described in Hanley et al. [6], who survey beachgoers at five Scottish beaches, asking them to report the number of beach visits, plus the number of beach visits that they would undertake if water quality was improved to meet European Union standards. Hanley et al. pool the data from hypothetical and actual trips, but do not test for hypothetical response effects. In their regressions quality is measured using the Likert scale score assigned subjectively by the respondent to water quality, rather than an objective measure of water quality.

B. Testing for Hypothetical Questions Effects

Equation (5) posits that when the price and the catch rate are varied to the respondents in the hypothetical scenarios, the effect on trips is the same as what would be observed through the cross-sectional variation in actual prices and catch rates. As previously explained, it is important to test if this assumption is borne out in the data.

This can be done by amending equation (5) to include a dummy variable, henceforth denoted as *Catch*, which takes on a value of one for the observations corresponding to scenarios 2 and 4, which posit improved catch rates. Formally, the new regression equation is

(8) $$TRIPS_{ij} = \mathbf{x}_i\beta + p_{ij}\gamma + catchrate_{ij}\delta_1 + Catch\delta_2 + p_{ij}^A\lambda + \varepsilon_{ij}\,.$$

We wish, therefore, to test the null hypothesis that $\delta_2 = 0$. Implicit in this testing procedure is the assumption that any hypothetical bias in the contingent behavior responses is constant across individuals.

It is, however, possible that the difference between the demand functions implied by actual and contingent behaviors, if any, varies across anglers. For example, it might be argued that the plausibility of the improved scenarios (and hence the reliability of the angler's response) varies with the past fishing experiences and skills, education, age, and perceptions of pollution.

Clearly, this type of heterogeneity in the reaction to the contingent behavior questions is related to observable variables. To see if this is the case, we add in the right-hand side of the model interactions between the *Catch* dummy and variables these factors. Rejection of the null that the coefficient(s) on the interaction(s) is (are) equal to different from zero would support the notion of observable heterogeneity in the reaction to the contingent behavior questions.

Finally, we allow for the possibility that there is heterogeneity in the response to the contingent behavior question about catch rate, but that this heterogeneity cannot be linked with observable characteristics. We propose to model this unobserved heterogeneity by fitting a random-coefficient regression equation. Formally,

(9) $$TRIPS_{ij} = \mathbf{x}_i \beta + p_{ij}\gamma + catchrate_{ij}\delta_1 + (Catchrate \times Catch)\delta_{2i} + p_{ij}^A \lambda + \varepsilon_{ij}$$

Where δ_{2i} is a random coefficient that varies across respondent, but is fixed across the observations contributed by the same angler. In other words, we assume that $\delta_{2i} = \overline{\delta}_2 + \xi_i$, where $\overline{\delta}_2$ is the expectation of δ_{2i}, and ξ_i is a normally distributed error term with mean zero and variance σ_ξ^2. Equation (9) can, therefore, be re-written as

(10) $$TRIPS_{ij} = \mathbf{x}_i \beta + p_{ij}\gamma + catchrate_{ij}\delta + (CCrate_{ij})\overline{\delta}_2 + p_{ij}^A \lambda + [\varepsilon_{ij} + CCrate_{ij} \cdot \xi_i],$$

Where CCrate=catchrate×catch, and all unobserved terms have been gathered inside the brackets.

In equation (10), the ε terms are iid and that they do not contain any individual-specific effects. By contrast, the overall errors—the terms in the brackets—are heteroskedastic *and* correlated overall an individual angler, due to the presence of the ξs. It is easily shown that the variances of the term in the brackets are equal to $\sigma_\varepsilon^2 + \sigma_\xi^2 \cdot CCrate_i^2$, and that the covariance between any two error terms within the same individual is $\sigma_\xi^2 \cdot CCrate_{ij} \cdot Ccrate_{ik}$ for j≠k. The error terms in the brackets in (10) are uncorrelated across anglers.

Model (10) is, therefore, estimated by (feasible) generalized least squares by minimizing

(11) $$\sum_{i=}^{n}[\mathbf{y}_i - \mathbf{Z}_i\boldsymbol{\theta}]'\mathbf{A}_{\mathrm{i}}^{-1}[\mathbf{y}_i - \mathbf{Z}_i\boldsymbol{\theta}],$$

where $\mathbf{y}$ is a 4×1 vector of observations on trips, $\mathbf{Z}$ is a matrix of suitable dimensions with all the right-hand side variables of equation (10), $\boldsymbol{\theta}$ is the vector of all regression coefficients in (10), and $\mathbf{A}$ is the matrix of error variances and covariances within individual i. We adopt an iteratively re-weighted least squares algorithm to obtain the GLS estimates.

C. The Choice of Regressors in the Econometric Model

Economic theory suggests that the demand for fishing trips should depend on the full price of a trip, which includes the opportunity cost of time (see section 2).[11] Measuring the opportunity cost of time, however, is fraught with difficulties,[12] which is the reason why we prefer to enter out-of-pocket price (*pricee*[13]) and income separately in our model.

We further include (i) household income divided by the number of household members (PCAPINC), (ii) a dummy that takes on a value of one if the respondent did not

[11] Earlier literature (since Cesario, [8]) has suggested that the opportunity cost of time should be about one-third of the market wage rate, and McConnell and Strand [9] have suggested an approach for estimating this fraction directly from the data reported by the respondent in a TCM survey. Recently, Feather and Shaw [10] [11] have proposed approaches for computing the value of time for individuals who are employed but do not choose the number of hours they works, and for individuals who choose not to work.
[12] Azevedo et al.[2] argue that the opportunity cost of price is likely to be measured with error, and that this may be well be one possible reason for differences in the slope of the actual and hypothetical demands for trips.
[13] *Pricee* is the sum of boat fuel costs, the cost of the car trip (fuel, wear-and-tear, and highway toll), the fee for launching the boat from a boat ramp, the cost of bait, and food and beverages.

answer the question about household income,[14] and (iii) a dummy (RETIRED) indicating whether the respondent is retired from the workforce, which captures time constraints, among other things.

When estimating a single-site TCM model, it is important to control for the price of a trip to an alternative site. Due to the extension of the Lagoon of Venice, its location, nature and species, there are very few sites that may serve as substitutes for it for sports fishing. We argue that only the Lagoon of Marano serves as a reasonable substitute for it, but only for those anglers in our sample that are not residents of Venice. For logistical reasons, the latter would find it extremely time consuming and costly to get their cars and drive to the Lagoon of Marano, with their boats in tow. Accordingly, we control for the travel cost to a substitute site by including the price of a trip to Marano (MARANO2), plus a dummy denoting whether the angler is a resident of the city of Venice. If so, we recode MARANO2 to zero. Finally, we include an additional regressor, BOAT, a dummy variable denoting use of the angler's own boat to go fishing.

V. The Data

A. Fishing Trips and Socio-demographics

The sample we examine in this paper is comprised of 269 individuals who report having taken fishing trips in the Lagoon of Venice over the last 12 months.

[14] Specifically, we create a dummy (PCAPINCMISS) taking on a value of one for those respondents who did not answer the household income question. If PCAPINCMISS=1, we recode income per household member (PCAPINC) to zero. Both PCAPINC and PCAPINCMISS must be entered in the right-hand side of the regression. The latter variable captures any systematic differences in fishing trips among those respondents who did and did not report information about their incomes. The coefficient of PCAPINC captures the net effect of the opportunity cost of time and any other ways in which income affects the demand for trips.

Descriptive statistics of the sample are reported in table 2. As shown in table 2, virtually all of the anglers in our sample are males. The average respondent is about 50 years old, has had about 10 years of schooling, and has an annual household income of €20,000. Retired persons account for about one-third of the sample.[15]

Regarding fishing behavior and experience, the average respondent reports taking about 30 trips a year in the Lagoon, for a total expenditure of about €765 a year. The average cost per trip is €31. On average, our anglers have been fishing in the Lagoon for 26 years, and more than 50% use their own boat on their Lagoon fishing trips.

In analyses not reported in this paper, we also found that Fascia A (=city of Venice) residents tend to be slightly older than the residents of other areas, their average age being 55 years versus 45-49. The Fascia A subsample tends to include more retired persons than the remainder of the sample (40% versus 15-39%). The average cost of a fishing trip is similar across zones, but Fascia A respondents take more fishing trips than the others (see Alberini et al. [12]).

B. Fishing Trips by Scenario

Under the current conditions, our subjects reported an average of 30 trips to the Lagoon in the 12 months prior to the survey. About 39 percent of the respondent took one to 12 trips, 35 percent took 13-30 trips, and 26 percent took more than 30.

When asked to consider a hypothetical situation with higher prices per trip, respondents announced that they would either keep the number of trips the same, or that

[15] The proportion of retired persons among Lagoon anglers is higher than among all holders of fishing license in the Province of Venice (18.3 %). The reason is that Lagoon sport fishing is closely related to traditional fishing in the Lagoon and hence requires plentiful time. Furthermore, the average age of people living in the historical center of Venice is higher than the one living outside.

they would take fewer trips. The average number of trips per year under scenario 2 is 14, with 38% of the respondents stating that they would no longer going fishing.

Under scenario 3, which has higher catch rates, people generally told us that they would take more trips, for an average of almost 39 per year. Under scenario 4, which posits higher prices and a higher catch rate, the average number of announced trips is 21, with 28% of the respondents reporting an intended number of trips equal to zero.

These figures suggest that the responses to the hypothetical trip questions are reasonable and consistent with well-behaved demand functions.[16]

C. Perception of Environmental Quality in the Lagoon of Venice

Our questionnaire also queries anglers about their perception of environmental quality in the Lagoon. We use three questions to explore this matter. The first asks whether the presence of chemical pollutants and industrial waste in the Lagoon is thought to affect catch rates. The second question asks the respondents if they feel that catch rates have been negatively affected by the introduction of the *tapes philippinarum* clam. The third question asks the respondent if he has changed his own fishing behavior as a result of pollution and this new species. Two response categories (yes and no) are provided for each of these questions.

We found that the majority of our respondents (91.9%) thought that pollution influences catch rates in the Lagoon. Eighty-two percent of our anglers felt that catch rates had been negatively impacted by the introduction of the *tapes philippinarum* clam,

---

[16] These aggregate figures suggest that the elasticity of trips with respect to price is roughly one, while that with respect to catch rate is roughly 0.6. This is broadly consistent with the characteristics of the sample, and with the presence of many retired persons with low incomes and high trip rates at the current conditions.

and 78% of them have actually changed their own fishing behavior as a result of pollution and exotic species. These response patterns suggest that anglers are aware of the potential effects of water quality and exotic species on catch rate, and they should accept hypothetical scenarios where improvements in catch rates are delivered by water quality and fishing management policies.

VI. Results

A. Models of Actual Trips

We begin our analysis with reporting and discussing the results of an OLS regression where the sample is restricted to actual trips. The results of this run are reported in table 3, column (A).

In this regression, the coefficient on price per trip is negative, as expected, and significant. Its magnitude, -0.14, implies that it takes an increase in price per trip of 10 euro to see a decrease of 1.4 in expected trips. The coefficient on MARANO2 is positive, as expected for the price of a substitute site, but insignificant, and that on FASCIAA is 15.34, implying that Venice residents take on average 15 more fishing trips than persons who live elsewhere in the study region.

The coefficient on CATCHRATE is large and significant. Any additional kilo of fish per trip raises fishing trips by almost 10 a year. Regarding income, the coefficient on this variable is negative, suggesting that it indeed captures the opportunity cost of time. The effect is strongly significant. Those persons who did not report their income are not significantly different from those who did in terms of trips, despite the large coefficient on PCAPINCM. Retired persons and boat owners take more trips than the other respondents, but the coefficients on these dummies are estimated imprecisely and only that on the latter is significant (at the 10% level).

B. Random-effects Models, Full Panel

In columns (B)-(D), we report the results of regressions that exploit the full panel of data, including intended trips at hypothetical conditions. To see the effect of the hypothetical trip data, compare column (B) with column (A): The coefficient on price in column (B) is -0.13, changing by less than 6% with respect to its counterpart in A. We conclude that the responses to the contingent behavior questions do not alter the slope of the demand function estimated using actual trips.

We therefore turn to examining whether this is true of the quality variable, the catch rate. The coefficient on catch rate in column (B) is 5.54, and is thus much lower (a 43% reduction) than the estimate we obtained from the cross-sectional regression that uses only actual trips.[17]

In column (C), we add the CATCH dummy to capture any differences in the sensitivity to the quality of the Lagoon across actual and contingent behavior trips. The coefficient on catch is negative, which is consistent with the changes observed from (A) to (B), but insignificant. The coefficients on the other regressors are similar to their counterparts in (B).

Our first check for possible heterogeneity across respondents in their sensitivity to contingent changes in catch rate is shown in column (D), where we drop CATCH and

[17] The coefficients on the remaining variable are similar to their counterparts in (A), except for that on income, which changes by 22%. The error terms within a respondent are indeed correlated, as implied by the random effects models, and the correlation coefficient between any two of them is 0.58.

enter the interaction term CATCH×CATCHRATE. This, however, results in an insignificant coefficient and brings little changes relative to (B) and (C). This implies that anglers do not react to hypothetical catch rates any differently than we would infer from the cross-sectional variation in actual rates.

Table 4 reports selected coefficients from random-effects models that include CATCHRATE, CATCH and various interactions between CATCH and individual characteristics of the respondent. We find little evidence of any effects that depend on observable characteristics of the respondent.

Next, we check whether the demand for trips and the sensitivity to hypothetical catch rates varies with the beliefs held by the respondent about pollution and with whether he has previously adjusted fishing behavior in reaction to the quality of the Lagoon. We do so by fitting separate regressions for two groups of respondents—those who did and did not change fishing behavior (CAMBIA=1 or 0, respectively)—but, as shown in table 5, found no differences across the estimated demand functions. We attempted the same approach for INQUI and VOGO, but this time one of the two groups was too small to result in a meaningful demand functions.

The estimation results for our preferred specification of the random-coefficients model are displayed in table 6. This specification can be compared to the random-effects model of (D) in table 3. There is evidence of some heteroskedasticity across respondents and correlation of the responses within anglers, as implied by the estimates of σ_ξ and σ_ε, but no evidence of a systematic hypothetical bias to changes in catch rates.

VII. Welfare Estimates

We use the simplest specification of our random-effects model (column (B), table 3) to predict angler surplus at the current conditions and the surplus change for a 50% improvement in catch rates. Surplus figures are displayed in table 7. At the average price per trip (€31.23) and income per household member (€7920.64 a year) in our sample, surplus at the current conditions is pegged at €1,774 a year, while the welfare change associated with the catch rate improvement is €1,056 a year.

The welfare calculations can be specialized to the residents of Venice (FASCIAA=1) and of the other areas in our sample (FASCIAA=0). Holding the price per trip the same across these two groups, but setting income per household member to €8474.55 for Venice residents and to €7391.00 for all others, we obtain surplus figures at the current conditions of €3043 a year for Venice residents and €769 a year for all others. A 50% change in catch rates yields surplus changes of €1379 a year for Venice residents and €745 a year for all others.

We use these two strata—residents of Venice (FASCIAA=1) and all others (FASCIAA=0)—to estimate the benefits of improvements of the sports fishing activity. We denote our welfare measure of interest with $S(\mathbf{x}_k, \hat{\beta})$, where $\mathbf{x}_k$ is a vector of regressors and $\hat{\beta}$ is a vector of estimated coefficients. The welfare measure for the population is, therefore, equal to:

(12) $$S = \sum_{k=1}^{2} S(\mathbf{x}_k, \hat{\beta}) \cdot N_k ,$$

where N_k is the number of Lagoon anglers in stratum k in the population, k=1 denotes Venice residents and k=2 Lagoon anglers who reside in other areas. $S(\mathbf{x}_k, \hat{\beta})$ is the surplus at the current conditions in our first estimation exercise, and the welfare change for stratum *k* associated with the catch rate improvement in our second estimation exercise.

For simplicity, in this paper attention is restricted to those anglers who currently go fishing in the Lagoon of Venice, ignoring the possibility that improvements in catch rates might entice other persons to go fishing in the Lagoon. This assumption leads to conservative benefit estimates.

No one knows exactly N_1 and N_2, the populations of Lagoon anglers that reside in Venice and in all other areas, respectively. In this paper, we offer estimates of these populations based on conservative assumptions.[18] We start with pointing out that the universe of fishing licenses valid in the Province of Venice is comprised of a total of 34018 persons. Of these, 4415 are residents of Venice and Lagoon islands, while the remaining 29603 live in other areas (for the most part, the inland portion of the Province of Venice, with some residents of the Provinces of Treviso and Padua).[19]

The first estimate is based on the conservative assumption that only the holders of fishing licenses that actually go fishing in the Lagoon bother to return the completed questionnaire,[20] and that our sample reflects the Lagoon fishing participation rates of the population. Since the questionnaire was returned by 13.4% of the recipients with Venice and Lagoon islands addresses, and 7.1% of the other recipients, we estimate N_1 to be equal to (4415*0.134)=591 and N_2 to be equal to (29603*0.071)=2102. The surplus associated with current fishing conditions is, therefore, €1,798,773 a year for Venice

[18] See Alberini et al. [12] for an alternate, and more generous, calculation of N_1 and N_2.
[19] We remind the reader that N_1 and N_2 are not the same as the number of holders of valid fishing licenses for the Province of Venice that reside in Venice and in other areas, respectively. This is because purchase of the fishing license entitles access to and use of many bodies of water in the Province of Venice, of which the Lagoon of Venice is only one. N_1 and N_2 are, therefore, less than or equal than 4415 and 29603, respectively.

residents and €1,617,047 for residents of other areas who go fishing in the Lagoon, for a total of €3,415,820 a year. The welfare change figures associated with a 50% improvement in catch rates are €812,113 and €1,566,620, for a total of €2,378,733 a year.

We remind the reader that these figures are not the only benefits of a proposed fish stocks maintenance policy: The total benefits include the benefits experienced by other categories of beneficiaries of the policy, such as commercial fishing outfits, other types of recreationists, plus the benefits of those anglers who start fishing as a result of the improved catch rates in the Lagoon. Once the full benefits of the policy are estimated, they can be compared with the costs of the program in a full-blown benefits-cost analysis.

VIII. Discussion and Conclusions

We have surveyed anglers who go fishing in the Lagoon of Venice to gather information about the frequency of their Lagoon fishing trips and cost incurred. We have then used this information to estimate a single-site TCM equation explaining trips as a function of cost per trip and other factors. In doing so, we have augmented our observations on actual trips and costs with the trips our respondents told us they would undertake under hypothetical changes in the cost per trip and in the catch rate. This additional information has allowed us to improve the efficiency of our estimate of the slope of the trip demand function. It has also allowed us to estimate the shift in the demand function associated with a 50% improvement in catch rate.

One key aspect of our research is the care we have taken to check that the responses to hypothetical scenarios reflect the same preferences as actual trips. We have

[20] Under this assumption, a person who received the questionnaire but did not fill it out is held to never go fishing in the Lagoon.

(a) compared demand functions based on actual and pooled actual-hypothetical trips, (b) estimated models with pooled data with dummies to check for hypothetical effects, and (c) tested extensively for heterogeneity in the response to the hypothetical scenario questions. In (c), we checked for both heterogeneity linked to observable characteristics of the responses, and to unobservable heterogeneity, which resulted in random-coefficient models.

We found no evidence that the responses to the actual and hypothetical questions are driven by different sets of preferences. Our results can be compared with those of Rosenberger and Loomis [1], who report no significant differences in the slope of the demand function for trips across actual and contingent behaviors. Azevedo et al. [2] find that there *are* significant differences in the coefficients on price across actual and hypothetical trips. In their study, people tend to be more responsive to price in the revealed preference data.[21] (Azevedo et al. [2], however, are careful to point out that the price of a trip is likely to be measured with an error, since the opportunity cost of time, one of the components of the price per trip, is imputed by the researcher.) By contrast, Grijalva et al. [3] find that pre-policy trips are less price-sensitive than post-policy trips.

Various cross-checks in our questionnaire further confirm that our data are reasonable and credible. Based on the results of our econometric models and on other evidence from our data, we believe that, with the due caution, our figures could be used for policy purposes. We illustrate a possible policy use of our figures by computing total surplus of access to the Lagoon of Venice, and the surplus change associated with policies that improve catch rates.

---

[21] By contrast, respondents gave heavier weight to the wage rate in the hypothetical scenarios.

To compute the population surplus and surplus change, it is necessary to multiply the surplus (surplus change) by the number of anglers who do fish in the Lagoon. No one knows exactly how many anglers visit the Lagoon, and how many of these anglers are Venice residents or residents of other areas. Based on conservative assumptions about the total number of Lagoon anglers, we obtain estimates of surplus at the current conditions of €3.4 million and of surplus change if catch rates improve of €2.4 million a year. Conversations with officials of the Province of Venice suggest that this conservative assumption is reasonable.

It should be kept in mind, however, that our calculations do not account for persons who do not go fishing in the Lagoon at this time, but could be enticed to do so if catch rates improved. Moreover, any benefit-cost analyses of proposed policies that seek to improve environmental quality and fish stocks in the Lagoon should also examine the benefits brought by these policies to other categories of beneficiaries, in addition to Lagoon anglers.

References

[1] Rosenberger R, John B. Loomis J. The Value of Ranch Open Space to Tourists: Combining Observed and Contingent Behavior Data. Growth and Change 1999; 30: 366-383.

[2] Azevedo C, Herriges J, Kling C. Combining Revealed and Stated Preferences: Consistency Tests and Their Interpretations. American Journal of Agricultural Economics 2003; 85(3): 525-537.

[3] Grijalva T, Berrens R, Bohara A, Douglass Shaw, W. Testing the Validity of Contingent Behavior Trip Responses. American Journal of Agricultural Economics 2002; 84(2): 401-414.

[4] Pranovi F, Giovanardi O. The Impact of Hydraulic Dredging for Short-necked Clams, Tapes sp. p., on an Infaunal Community in the Lagoon of Venice. Scientia Marina 1994; 58(4): 345-353.

[5] Istituto Centrale per la Ricerca Scientifica e Tecnologica Applicata al Mare (ICRAM). Studio dell'impatto della raccolta delle vongole veraci filippine (Tapes philippinarum) nella Laguna di Venezia per una gestione razionale della risorsa e dell'ambiente, IV Piano Triennale Pesca Acquacoltura. I° Rapporto Intermedio. Università di Trieste, 1999.

[6] Hanley N, Bell D, Alvarez-Farizo B. Valuing the Benefits of Coastal Water Quality Improvements Using Contingent and Real Behavior. Environmental and Resource Economics 2003; 24: 273-285.

[7] Freeman AM. The Measurement of Environmental and Resource Values, Washington DC: Resources for the Future, 2003.

[8] Cesario FJ. Value of Time and Recreation Benefit Studies. Land Economics 1976; 52(1): 32-41.

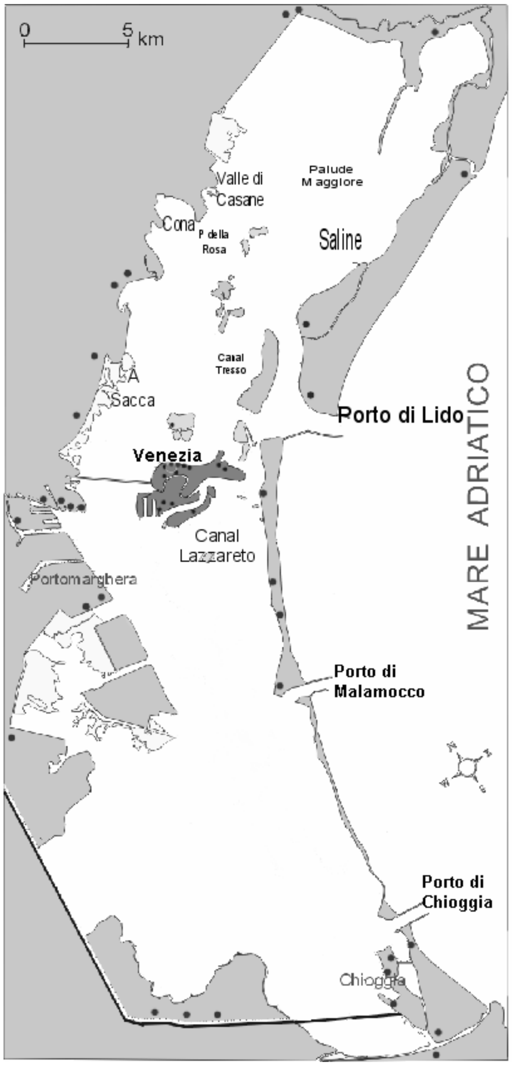
[9] McConnell KE, Strand IE. Measuring the Cost of Time in Recreation Demand Analysis: An Application to Sport Fishing. American Journal of Agricultural Economics 1981; 63(1): 153-156.

[10] Feather P, Douglass Shaw W. Estimating the Cost of Leisure Time for Recreation Demand Models. Journal of Environmental Economics and Management 1999; 38: 49-65.

[11] Feather P, Douglass Shaw W. The Demand For Leisure Time in the Presence of Constrained Work Hours. Economic Inquiry 2000; 38(4): 651-661.

[12] Zanatta V, Alberini A, Rosato P, Longo A. The Value of Recreational Sport Fishing in the Lagoon of Venice. In: Alberini A, Rosato P, Turvani M. The Safeguarding of the Lagoon of Venice: An Economic Valuation. New Horizons in Environmental Economics series. UK: Edwar Elgar, 2005 forthcoming.

Appendix A. Lagoon of Venice.



Tables

Table 1. Survey Design.

Scenario	Type	Price per trip	Catch rate
1	Actual	Actual price per trip (p_{i0})	Current conditions (cr_{i0})
2	Hypothetical	Higher price: ($p_{i1} = (1+X)p_{i0}$), where X is selected at random out of {0.20, 0.40, 0.60, 0.80, 1.00}	Current conditions (cr_{i0})
3	Hypothetical	Actual price per trip (p_{i0})	Increase of 50% over current conditions: $cr_{i1} = cr_{i0} \cdot (1 + 0.5)$
4	Hypothetical	Higher price: ($p_{i1} = (1+X)p_{i0}$), where X is the same as in scenario 2	Increase of 50% over current conditions: $cr_{i1} = cr_{i0} \cdot (1 + 0.5)$

Table 2. Descriptive statistics for the sample (n=269).

Variable	**Sample average (standard deviation in parentheses)**
Individual characteristics of the respondent	
Age (ETA) (years)	51.22 (14.74)
Male (SEX) (dummy)	0.985 (0.12)
Annual Household income* (INCOME)	€ 20524 (€ 15389)
Does not report INCOME (PCAPINCM) (dummy)	0.078 (0.26)
Annual Income per member of the household* (PCAPINC)	€7920.64 (6351.51)
Retired person (RETIRED) (dummy)	0.334 (0.47)
Years of schooling (EDUCATION)	9.80 (3.83)
Fishing behavior and experience	
Price per trip to the Lagoon of Venice (PRICEE)	€ 31.23 (€ 37.89)
Number of fishing trips in the Lagoon in the last 12 months (QVPLA)	30.28 (35.30)
Uses own boat to go fishing (BOAT) (dummy)	0.580 (0.49)
Numbers of years the respondent has been fishing in the Lagoon (DQAP)	26.37 (16.76)
Price per trip to the Lagoon of Marano (MARANO2)	€ 23.07 (€ 40.76)
Catch rate (CATCHRATE) (kilograms per trip)	2.98 (1.05)

* Calculated for those respondents who do report household income.

Table 3 – Travel cost models. Dependent variables: fishing trips per year (t statistics in parentheses).

	Model A	Model B	Model C	Model D
Constant	-1.2160 (0.16)	4.1878 (0.86)	2.9441 (0.55)	0.2202 (0.04)
PRICEE	-0.1432 (-2.29)	-0.1348 (-4.01)	-0.1340 (-4.00)	-0.1345 (-4.00)
MARANO2	0.023 (0.24)	0.0253 (0.51)	0.0257 (0.50)	0.0260 (0.52)
FASCIAA	15.3402 (2.63)	12.7319 (2.95)	12.6532 (2.93)	12.5660 (2.90)
CATCHRATE	9.7307 (5.20)	5.5488 (7.94)	6.0869 (5.26)	7.0868 (4.30)
CATCH			-1.2611 (-0.58)	
CATCHRATE * CATCH				-0.6643 (-1.03)
PCAPINC	-0.0009 (-2.81)	-0.0007 (-2.36)	-0.0007 (-2.36)	-0.0007 (-2.35)
PCAPINCM	-6.9558 (-0.89)	-5.2754 (-0.78)	-5.0007 (-0.74)	-4.6936 (-0.69)
RETIRED	6.5931 (1.60)	5.8301 (1.62)	5.7966 (1.61)	5.7597 (1.60)
BOAT	7.8550 (1.85)	6.4257 (1.76)	6.2177 (1.69)	5.9859 (1.63)
R-square	0.2351	0.1625	0.1638	0.1648
N	267	1068	1068	1068
$\hat{\sigma}_{\varepsilon}$	30.85			
$\hat{\sigma}_{\nu}$		25.24	25.23	25.24
$\hat{\sigma}_{\eta}$		21.30	21.31	21.30
correlation		0.5840	0.5837	0.5840

Model A = linear regression model, only 1 observation per person, actual number of trips only. Model B, C, D = linear models, random effects, 4 observations per person.

Table 4. Random-effects models to test for systematic heterogeneity in the response to the hypothetical catch rates. (t statistics in parentheses).

	Model I	Model II	Model III	Model IV	Model V	Model VI	Model VII	Model VIII
Constant	2.9489 (0.55)	4.4460 (0.83)	4.2641 (0.79)	3.5828 (0.67)	2.3415 (0.43)	2.1606 (0.40)	2.2580 (0.43)	2.7515 (0.44)
PRICEE	-0.1345 (-4.00)	-0.1347 (-4.01)	-0.1336 (-3.97)	-0.1339 (-3.98)	-0.1345 (-4.00)	-0.1345 (-4.00)	-0.1369 (-4.08)	-0.1351 (-4.01)
MARANO2	0.0256 (0.51)	0.0256 (0.51)	0.0244 (0.49)	0.0249 (0.50)	0.0256 (0.51)	0.0256 (0.51)	0.0288 (0.58)	0.0263 (0.52)
FASCIAA	12.6528 (2.93)	10.2937 (2.28)	10.7122 (2.39)	11.6900 (2.63)	12.6512 (2.92)	12.6424 (2.92)	13.0117 (3.02)	12.6093 (2.91)
CATCHRATE	6.0872 (5.26)	5.9651 (5.15)	5.9594 (5.14)	6.0150 (5.19)	6.0993 (5.27)	6.1592 (5.31)	6.1730 (5.36)	6.1452 (5.25)
CATCH	-1.2735 (-0.54)	-3.4134 (-1.39)	-2.9364 (-1.23)	-2.0777 (-0.89)	-0.1432 (-0.05)	-0.1983 (-0.08)	3.7258 (0.99)	-0.5436 (-0.11)
PCAPINC	-0.0006 (-2.36)	-0.0006 (-2.36)	-0.0006 (-2.37)	-0.0006 (-2.34)	-0.0006 (-1.98)	-0.0006 (-2.36)	-0.0006 (-2.17)	-0.0006 (-2.34)
PCAPINCM	-5.0005 (-0.74)	-5.0627 (-0.75)	5.0772 (-0.75)	-5.0658 (-0.75)	-4.9943 (-0.74)	-4.9637 (-0.73)	-4.6892 (-0.70)	-4.9304 (-0.72)
RETIRED	5.7783 (1.50)	5.8051 (1.61)	5.7553 (1.59)	5.8590 (1.62)	5.7956 (1.61)	5.7919 (1.61)	5.2567 (1.46)	5.7446 (1.59)
BOAT	6.2172 (1.69)	6.2658 (1.70)	6.3123 (1.71)	6.2058 (1.69)	6.2127 (1.69)	7.1977 (1.85)	6.2507 (1.71)	6.2974 (1.71)
CATCH*RETIRED	0.0358 (0.01)							
CATCH*FASCIAA		4.7567 (1.82)						
GEOAWARE1 (=INQUI*FASCIAA* CATCH)			4.2205 (1.62)					
GEOAWARE2 (=CAMBIA*FASCIAA* CATCH)				2.5166 (0.95)				
CATCH*PCAPINC					-0.0001 (-0.70)			
CATCH*BOAT						-2.0162 (-0.76)		
CATCH*EDUC							-0.5220 (-1.63)	
CATCH*INQUI								0.7032 (0.16)
CATCH*CAMBIA								-1.5521 (-0.51)
CATCH*VOGO								-0.2828 (-0.09)
R-square	0.1638	0.1646	0.1636	0.1630	0.1640	0.1640	0.1686	0.1645
N	1068	1068	1068	1068	1068	1068	1068	1068
$\hat{\sigma}_{\nu}$	25.23	25.24	25.27	25.22	25.23	25.23	25.01	25.32
$\hat{\sigma}_{\eta}$	21.32	21.27	21.27	21.29	21.31	21.31	21.31	21.34
correlation	0.5833	0.5846	0.5852	0.5838	0.5835	0.5834	0.5794	0.5845

Table 5. Estimated coefficients for selected regressors in random effects models for various groups of respondents.

	CAMBIA=0 (n=232)	CAMBIA=1 (n=836)	INQUI=0 (n=92)	INQUI=1 (n=976)	VOGO=0 (n=194)	VOGO=1 (n=876)
CATCHRATE	5.6709 (t = 1.90)	6.0652 (t = 4.98)	Too unstable to compare		Too unstable to compare	
CATCH	-0.3669 (t = -0.07)	-1.3156 (t = -0.56)	Too unstable to compare		Too unstable to compare	

CAMBIA=dummy equal to one if the respondents changed behaviors in response to perceived pollution problems.
INQUI= dummy equal to one if the respondents perceive that pollution problems have seriously damaged the lagoon environment.
VOGO= dummy equal to one if the respondents perceive that *tapes philippinarum* introduction has seriously changed the natural lagoon environment.

Table 6. Random-coefficient model of trips (t statistics in parentheses).

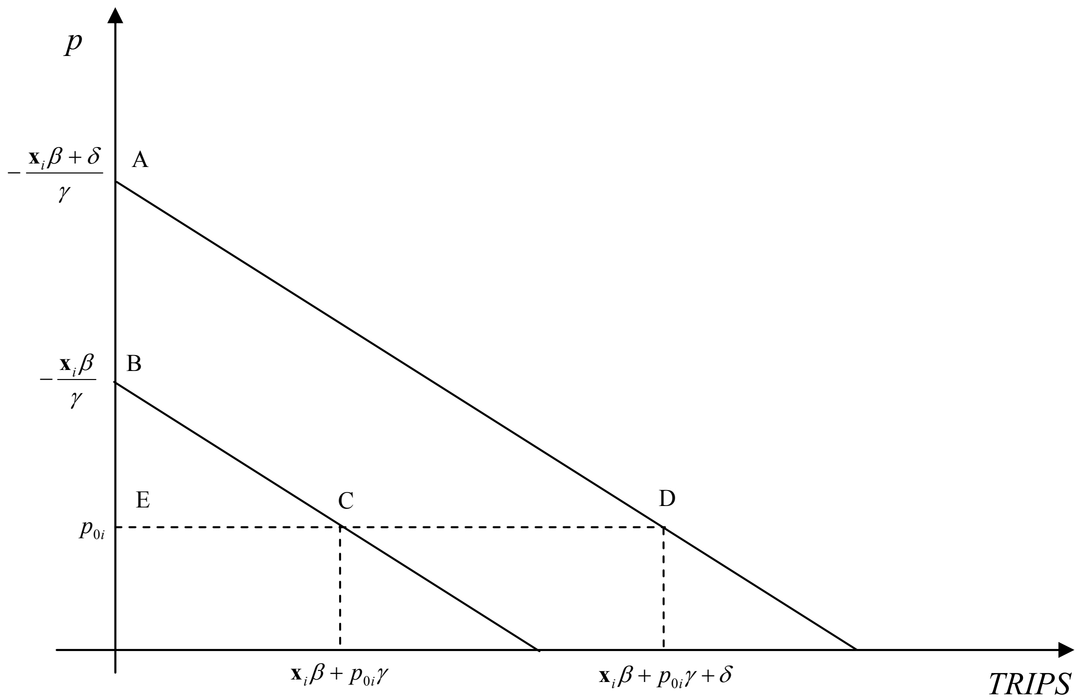
Constant	-1.0358 (-0.28)
PRICEE	-0.1414 (-4.26)
MARANO2	0.0873 (1.83)
FASCIAA	13.8549 (4.55)
CATCHRATE	6.4503 (6.56)
CATCHRATE * CATCH	-0.4531 (-0.81)
PCAPINC	-0.0007 (-3.86)
PCAPINCM	-1.3546 (-0.35)
RETIRED	5.8253 (1.67)
BOAT	7.7506 (3.55)
N	1068
$\hat{\sigma}_{\xi}$	27.64
$\hat{\sigma}_{\varepsilon}$	28.57

Table 7. Surplus and surplus changes after 50% catch rate improvement.
Based on specification (B), table 3.

Anglers	**Surplus at current catch rate (€ per year)**	**Surplus at improved catch rate (€ per year)**	**Surplus difference (€ per year)**
All respondents	1774.06	2830.38	1056.32
Respondents living in the city of Venice and the islands of the Lagoon (ZONA=1)	3043.61	4422.82	1379.21
Respondents living in other areas (ZONA=2, 3, or 4)	769.29	1514.59	745.30

Figures

Figure 1



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.ssrn.com/link/feem.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	*Masahisa 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
ETA	5.2004	*Romano PIRAS:* Growth, Congestion of Public Goods, and Second-Best Optimal Policy
CCMP	6.2004	*Herman R.J. VOLLEBERGH:* Lessons from the Polder: Is Dutch CO2-Taxation Optimal
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	10.2004	*Florian ENGLMAIER, Pablo GUILLEN, Loreto LLORENTE, Sander ONDERSTAL and Rupert SAUSGRUBER* (lxv): The Chopstick Auction: A Study of the Exposure Problem in Multi-Unit Auctions
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
PRA	16.2004	*Marta STRYSZOWSKA* (lxv): Late and Multiple Bidding in Competing Second Price Internet Auctions
CCMP	17.2004	*Slim Ben YOUSSEF:* R&D in Cleaner Technology and International Trade
NRM	18.2004	*Angelo 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	20.2004	*Guido CANDELA and Roberto CELLINI* (lxvii): Investment in Tourism Market: A Dynamic Model of Differentiated Oligopoly
NRM	21.2004	*Jacqueline M. HAMILTON* (lxvii): Climate and the Destination Choice of German Tourists
NRM	22.2004	*Javier Rey-MAQUIEIRA PALMER, Javier LOZANO IBÁÑEZ and Carlos Mario GÓMEZ GÓMEZ* (lxvii): Land, Environmental Externalities and Tourism Development
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	25.2004	*Riaz SHAREEF* (lxvii): Country Risk Ratings of Small Island Tourism Economies
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
CSRM	28.2004	*Nicoletta FERRO:* Cross-Country Ethical Dilemmas in Business: A Descriptive Framework
NRM	29.2004	*Marian WEBER* (lxvi): 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* (lxvi): Output Substitution in Multi-Species Trawl Fisheries: Implications for Quota Setting
CCMP	31.2004	*Marzio GALEOTTI, Alessandra GORIA, Paolo MOMBRINI and Evi SPANTIDAKI:* Weather Impacts on Natural, Social and Economic Systems (WISE) Part I: Sectoral Analysis of Climate Impacts in Italy
CCMP	32.2004	*Marzio GALEOTTI, Alessandra GORIA ,Paolo MOMBRINI and Evi SPANTIDAKI:* Weather Impacts on Natural, Social and Economic Systems (WISE) Part II: Individual Perception of Climate Extremes in Italy
CTN	33.2004	*Wilson PEREZ:* Divide and Conquer: Noisy Communication in Networks, Power, and Wealth Distribution
KTHC	34.2004	*Gianmarco I.P. OTTAVIANO and Giovanni PERI* (lxviii): The Economic Value of Cultural Diversity: Evidence from US Cities
KTHC	35.2004	*Linda CHAIB* (lxviii): Immigration and Local Urban Participatory Democracy: A Boston-Paris Comparison

KTHC	36.2004	*Franca ECKERT COEN and Claudio ROSSI* (lxviii): Foreigners, Immigrants, Host Cities: The Policies of Multi-Ethnicity in Rome. Reading Governance in a Local Context
KTHC	37.2004	*Kristine CRANE* (lxviii): Governing Migration: Immigrant Groups' Strategies in Three Italian Cities – Rome, Naples and Bari
KTHC	38.2004	*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
ETA	39.2004	*Alberto CAVALIERE:* Price Competition with Information Disparities in a Vertically Differentiated Duopoly
PRA	40.2004	*Andrea BIGANO and Stef PROOST:* The Opening of the European Electricity Market and Environmental Policy: Does the Degree of Competition Matter?
CCMP	41.2004	*Micheal FINUS* (lxix): International Cooperation to Resolve International Pollution Problems
KTHC	42.2004	*Francesco CRESPI:* Notes on the Determinants of Innovation: A Multi-Perspective Analysis
CTN	43.2004	*Sergio CURRARINI and Marco MARINI:* Coalition Formation in Games without Synergies
CTN	44.2004	*Marc ESCRIHUELA-VILLAR:* Cartel Sustainability and Cartel Stability
NRM	45.2004	*Sebastian BERVOETS and Nicolas GRAVEL* (lxvi): Appraising Diversity with an Ordinal Notion of Similarity: An Axiomatic Approach
NRM	46.2004	*Signe ANTHON and Bo JELLESMARK THORSEN* (lxvi): Optimal Afforestation Contracts with Asymmetric Information on Private Environmental Benefits
NRM	47.2004	*John MBURU* (lxvi)*:* Wildlife Conservation and Management in Kenya: Towards a Co-management Approach
NRM	48.2004	*Ekin BIROL, Ágnes GYOVAI and Melinda SMALE* (lxvi)*:* Using a Choice Experiment to Value Agricultural Biodiversity on Hungarian Small Farms: Agri-Environmental Policies in a Transition al Economy
CCMP	49.2004	*Gernot KLEPPER and Sonja PETERSON:* The EU Emissions Trading Scheme. Allowance Prices, Trade Flows, Competitiveness Effects
GG	50.2004	*Scott BARRETT and Michael HOEL:* Optimal Disease Eradication
CTN	51.2004	*Dinko DIMITROV, Peter BORM, Ruud HENDRICKX and Shao CHIN SUNG:* Simple Priorities and Core Stability in Hedonic Games
SIEV	52.2004	*Francesco RICCI*: Channels of Transmission of Environmental Policy to Economic Growth: A Survey of the Theory
SIEV	53.2004	*Anna ALBERINI, Maureen CROPPER, Alan KRUPNICK and Nathalie B. SIMON:* Willingness to Pay for Mortality Risk Reductions: Does Latency Matter?
NRM	54.2004	*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 Renaturated Streams
NRM	55.2004	*Timo GOESCHL and Tun LIN* (lxvi): Biodiversity Conservation on Private Lands: Information Problems and Regulatory Choices
NRM	56.2004	*Tom DEDEURWAERDERE* (lxvi): Bioprospection: From the Economics of Contracts to Reflexive Governance
CCMP	57.2004	*Katrin REHDANZ and David MADDISON:* The Amenity Value of Climate to German Households
CCMP	58.2004	*Koen SMEKENS and Bob VAN DER ZWAAN:* Environmental Externalities of Geological Carbon Sequestration Effects on Energy Scenarios
NRM	59.2004	*Valentina BOSETTI, Mariaester CASSINELLI and Alessandro LANZA* (lxvii): Using Data Envelopment Analysis to Evaluate Environmentally Conscious Tourism Management
NRM	60.2004	*Timo GOESCHL and Danilo CAMARGO IGLIORI* (lxvi):Property Rights Conservation and Development: An Analysis of Extractive Reserves in the Brazilian Amazon
CCMP	61.2004	*Barbara BUCHNER and Carlo CARRARO*: Economic and Environmental Effectiveness of a Technology-based Climate Protocol
NRM	62.2004	*Elissaios PAPYRAKIS and Reyer GERLAGH*: Resource-Abundance and Economic Growth in the U.S.
NRM	63.2004	*Györgyi BELA, György PATAKI, Melinda SMALE and Mariann HAJDÚ* (lxvi): Conserving Crop Genetic Resources on Smallholder Farms in Hungary: Institutional Analysis
NRM	64.2004	*E.C.M. RUIJGROK and E.E.M. NILLESEN* (lxvi): The Socio-Economic Value of Natural Riverbanks in the Netherlands
NRM	65.2004	*E.C.M. RUIJGROK* (lxvi): Reducing Acidification: The Benefits of Increased Nature Quality. Investigating the Possibilities of the Contingent Valuation Method
ETA	66.2004	*Giannis VARDAS and Anastasios XEPAPADEAS*: Uncertainty Aversion, Robust Control and Asset Holdings
GG	67.2004	*Anastasios XEPAPADEAS and Constadina PASSA*: Participation in and Compliance with Public Voluntary Environmental Programs: An Evolutionary Approach
GG	68.2004	*Michael FINUS*: Modesty Pays: Sometimes!
NRM	69.2004	*Trond BJØRNDAL and Ana BRASÃO*: The Northern Atlantic Bluefin Tuna Fisheries: Management and Policy Implications
CTN	70.2004	*Alejandro CAPARRÓS, Abdelhakim HAMMOUDI and Tarik TAZDAÏT*: On Coalition Formation with Heterogeneous Agents
IEM	71.2004	*Massimo GIOVANNINI, Margherita GRASSO, Alessandro LANZA and Matteo MANERA*: Conditional Correlations in the Returns on Oil Companies Stock Prices and Their Determinants
IEM	72.2004	*Alessandro LANZA, Matteo MANERA and Michael MCALEER*: Modelling Dynamic Conditional Correlations in WTI Oil Forward and Futures Returns
SIEV	73.2004	*Margarita GENIUS and Elisabetta STRAZZERA*: The Copula Approach to Sample Selection Modelling: An Application to the Recreational Value of Forests

CCMP	74.2004	*Rob DELLINK and Ekko van IERLAND*: Pollution Abatement in the Netherlands: A Dynamic Applied General Equilibrium Assessment
ETA	75.2004	*Rosella LEVAGGI and Michele MORETTO*: Investment in Hospital Care Technology under Different Purchasing Rules: A Real Option Approach
CTN	76.2004	*Salvador BARBERÀ and Matthew O. JACKSON* (lxx): On the Weights of Nations: Assigning Voting Weights in a Heterogeneous Union
CTN	77.2004	*Àlex ARENAS, Antonio CABRALES, Albert DÍAZ-GUILERA, Roger GUIMERÀ and Fernando VEGA-REDONDO* (lxx): Optimal Information Transmission in Organizations: Search and Congestion
CTN	78.2004	*Francis BLOCH and Armando GOMES* (lxx): Contracting with Externalities and Outside Options
CTN	79.2004	*Rabah AMIR, Effrosyni DIAMANTOUDI and Licun XUE* (lxx): Merger Performance under Uncertain Efficiency Gains
CTN	80.2004	*Francis BLOCH and Matthew O. JACKSON* (lxx): The Formation of Networks with Transfers among Players
CTN	81.2004	*Daniel DIERMEIER, Hülya ERASLAN and Antonio MERLO* (lxx): Bicameralism and Government Formation
CTN	82.2004	*Rod GARRATT, James E. PARCO, Cheng-ZHONG QIN and Amnon RAPOPORT* (lxx): Potential Maximization and Coalition Government Formation
CTN	83.2004	*Kfir ELIAZ, Debraj RAY and Ronny RAZIN* (lxx): Group Decision-Making in the Shadow of Disagreement
CTN	84.2004	*Sanjeev GOYAL, Marco van der LEIJ and José Luis MORAGA-GONZÁLEZ* (lxx): Economics: An Emerging Small World?
CTN	85.2004	*Edward CARTWRIGHT* (lxx): Learning to Play Approximate Nash Equilibria in Games with Many Players
IEM	86.2004	*Finn R. FØRSUND and Michael HOEL*: Properties of a Non-Competitive Electricity Market Dominated by Hydroelectric Power
KTHC	87.2004	*Elissaios PAPYRAKIS and Reyer GERLAGH*: Natural Resources, Investment and Long-Term Income
CCMP	88.2004	*Marzio GALEOTTI and Claudia KEMFERT*: Interactions between Climate and Trade Policies: A Survey
IEM	89.2004	*A. MARKANDYA, S. PEDROSO and D. STREIMIKIENE*: Energy Efficiency in Transition Economies: Is There Convergence Towards the EU Average?
GG	90.2004	*Rolf GOLOMBEK and Michael HOEL* : Climate Agreements and Technology Policy
PRA	91.2004	*Sergei IZMALKOV* (lxv): Multi-Unit Open Ascending Price Efficient Auction
KTHC	92.2004	*Gianmarco I.P. OTTAVIANO and Giovanni PERI*: Cities and Cultures
KTHC	93.2004	*Massimo DEL GATTO*: Agglomeration, Integration, and Territorial Authority Scale in a System of Trading Cities. Centralisation versus devolution
CCMP	94.2004	*Pierre-André JOUVET, Philippe MICHEL and Gilles ROTILLON*: Equilibrium with a Market of Permits
CCMP	95.2004	*Bob van der ZWAAN and Reyer GERLAGH*: Climate Uncertainty and the Necessity to Transform Global Energy Supply
CCMP	96.2004	*Francesco BOSELLO, Marco LAZZARIN, Roberto ROSON and Richard S.J. TOL*: Economy-Wide Estimates of the Implications of Climate Change: Sea Level Rise
CTN	97.2004	*Gustavo BERGANTIÑOS and Juan J. VIDAL-PUGA*: Defining Rules in Cost Spanning Tree Problems Through the Canonical Form
CTN	98.2004	*Siddhartha BANDYOPADHYAY and Mandar OAK*: Party Formation and Coalitional Bargaining in a Model of Proportional Representation
GG	99.2004	*Hans-Peter WEIKARD, Michael FINUS and Juan-Carlos ALTAMIRANO-CABRERA*: The Impact of Surplus Sharing on the Stability of International Climate Agreements
SIEV	100.2004	*Chiara M. TRAVISI and Peter NIJKAMP*: Willingness to Pay for Agricultural Environmental Safety: Evidence from a Survey of Milan, Italy, Residents
SIEV	101.2004	*Chiara M. TRAVISI, Raymond J. G. M. FLORAX and Peter NIJKAMP*: A Meta-Analysis of the Willingness to Pay for Reductions in Pesticide Risk Exposure
NRM	102.2004	*Valentina BOSETTI and David TOMBERLIN:* Real Options Analysis of Fishing Fleet Dynamics: A Test
CCMP	103.2004	*Alessandra GORIA e Gretel GAMBARELLI:* Economic Evaluation of Climate Change Impacts and Adaptability in Italy
PRA	104.2004	*Massimo FLORIO and Mara GRASSENI*: The Missing Shock: The Macroeconomic Impact of British Privatisation
PRA	105.2004	*John BENNETT, Saul ESTRIN, James MAW and Giovanni URGA*: Privatisation Methods and Economic Growth in Transition Economies
PRA	106.2004	*Kira BÖRNER*: The Political Economy of Privatization: Why Do Governments Want Reforms?
PRA	107.2004	*Pehr-Johan NORBÄCK and Lars PERSSON*: Privatization and Restructuring in Concentrated Markets
SIEV	108.2004	*Angela GRANZOTTO, Fabio PRANOVI, Simone LIBRALATO, Patrizia TORRICELLI and Danilo MAINARDI*: Comparison between Artisanal Fishery and Manila Clam Harvesting in the Venice Lagoon by Using Ecosystem Indicators: An Ecological Economics Perspective
CTN	109.2004	*Somdeb LAHIRI*: The Cooperative Theory of Two Sided Matching Problems: A Re-examination of Some Results
NRM	110.2004	*Giuseppe DI VITA*: Natural Resources Dynamics: Another Look
SIEV	111.2004	*Anna ALBERINI, Alistair HUNT and Anil MARKANDYA*: Willingness to Pay to Reduce Mortality Risks: Evidence from a Three-Country Contingent Valuation Study
KTHC	112.2004	*Valeria PAPPONETTI and Dino PINELLI*: Scientific Advice to Public Policy-Making
SIEV	113.2004	*Paulo A.L.D. NUNES and Laura ONOFRI*: The Economics of Warm Glow: A Note on Consumer's Behavior and Public Policy Implications
IEM	114.2004	*Patrick CAYRADE*: Investments in Gas Pipelines and Liquefied Natural Gas Infrastructure What is the Impact on the Security of Supply?
IEM	115.2004	*Valeria COSTANTINI and Francesco GRACCEVA:* Oil Security. Short- and Long-Term Policies

IEM	116.2004	*Valeria COSTANTINI and Francesco GRACCEVA:* Social Costs of Energy Disruptions
IEM	117.2004	*Christian EGENHOFER, Kyriakos GIALOGLOU, Giacomo LUCIANI, Maroeska BOOTS, Martin SCHEEPERS, Valeria COSTANTINI, Francesco GRACCEVA, Anil MARKANDYA and Giorgio VICINI*: Market-Based Options for Security of Energy Supply
IEM	118.2004	*David FISK*: Transport Energy Security. The Unseen Risk?
IEM	119.2004	*Giacomo LUCIANI*: Security of Supply for Natural Gas Markets. What is it and What is it not?
IEM	120.2004	*L.J. de VRIES and R.A. HAKVOORT*: The Question of Generation Adequacy in Liberalised Electricity Markets
KTHC	121.2004	*Alberto PETRUCCI*: Asset Accumulation, Fertility Choice and Nondegenerate Dynamics in a Small Open Economy
NRM	122.2004	*Carlo GIUPPONI, Jaroslaw MYSIAK and Anita FASSIO*: An Integrated Assessment Framework for Water Resources Management: A DSS Tool and a Pilot Study Application
NRM	123.2004	*Margaretha BREIL, Anita FASSIO, Carlo GIUPPONI and Paolo ROSATO*: Evaluation of Urban Improvement on the Islands of the Venice Lagoon: A Spatially-Distributed Hedonic-Hierarchical Approach
ETA	124.2004	*Paul MENSINK*: Instant Efficient Pollution Abatement Under Non-Linear Taxation and Asymmetric Information: The Differential Tax Revisited
NRM	125.2004	*Mauro FABIANO, Gabriella CAMARSA, Rosanna DURSI, Roberta IVALDI, Valentina MARIN and Francesca PALMISANI*: Integrated Environmental Study for Beach Management:A Methodological Approach
PRA	126.2004	*Irena GROSFELD and Iraj HASHI*: The Emergence of Large Shareholders in Mass Privatized Firms: Evidence from Poland and the Czech Republic
CCMP	127.2004	*Maria BERRITTELLA, Andrea BIGANO, Roberto ROSON and Richard S.J. TOL*: A General Equilibrium Analysis of Climate Change Impacts on Tourism
CCMP	128.2004	*Reyer GERLAGH*: A Climate-Change Policy Induced Shift from Innovations in Energy Production to Energy Savings
NRM	129.2004	*Elissaios PAPYRAKIS and Reyer GERLAGH*: Natural Resources, Innovation, and Growth
PRA	130.2004	*Bernardo BORTOLOTTI and Mara FACCIO*: Reluctant Privatization
SIEV	131.2004	*Riccardo SCARPA and Mara THIENE*: Destination Choice Models for Rock Climbing in the Northeast Alps: A Latent-Class Approach Based on Intensity of Participation
SIEV	132.2004	*Riccardo SCARPA Kenneth G. WILLIS and Melinda ACUTT*: Comparing Individual-Specific Benefit Estimates for Public Goods: Finite Versus Continuous Mixing in Logit Models
IEM	133.2004	*Santiago J. RUBIO*: On Capturing Oil Rents with a National Excise Tax Revisited
ETA	134.2004	*Ascensión ANDINA DÍAZ*: Political Competition when Media Create Candidates' Charisma
SIEV	135.2004	*Anna ALBERINI*: Robustness of VSL Values from Contingent Valuation Surveys
CCMP	136.2004	*Gernot KLEPPER and Sonja PETERSON*: Marginal Abatement Cost Curves in General Equilibrium: The Influence of World Energy Prices
ETA	137.2004	*Herbert DAWID, Christophe DEISSENBERG and Pavel ŠEVČIK*: Cheap Talk, Gullibility, and Welfare in an Environmental Taxation Game
CCMP	138.2004	*ZhongXiang ZHANG*: The World Bank's Prototype Carbon Fund and China
CCMP	139.2004	*Reyer GERLAGH and Marjan W. HOFKES*: Time Profile of Climate Change Stabilization Policy
NRM	140.2004	*Chiara D'ALPAOS and Michele MORETTO*: The Value of Flexibility in the Italian Water Service Sector: A Real Option Analysis
PRA	141.2004	*Patrick BAJARI, Stephanie HOUGHTON and Steven TADELIS* (lxxi): Bidding for Incompete Contracts
PRA	142.2004	*Susan ATHEY, Jonathan LEVIN and Enrique SEIRA* (lxxi): Comparing Open and Sealed Bid Auctions: Theory and Evidence from Timber Auctions
PRA	143.2004	*David GOLDREICH* (lxxi): Behavioral Biases of Dealers in U.S. Treasury Auctions
PRA	144.2004	*Roberto BURGUET* (lxxi): Optimal Procurement Auction for a Buyer with Downward Sloping Demand: More Simple Economics
PRA	145.2004	*Ali HORTACSU and Samita SAREEN* (lxxi): Order Flow and the Formation of Dealer Bids: An Analysis of Information and Strategic Behavior in the Government of Canada Securities Auctions
PRA	146.2004	*Victor GINSBURGH, Patrick LEGROS and Nicolas SAHUGUET* (lxxi): How to Win Twice at an Auction. On the Incidence of Commissions in Auction Markets
PRA	147.2004	*Claudio MEZZETTI, Aleksandar PEKEČ and Ilia TSETLIN* (lxxi): Sequential vs. Single-Round Uniform-Price Auctions
PRA	148.2004	*John ASKER and Estelle CANTILLON* (lxxi): Equilibrium of Scoring Auctions
PRA	149.2004	*Philip A. HAILE, Han HONG and Matthew SHUM* (lxxi): Nonparametric Tests for Common Values in First-Price Sealed-Bid Auctions
PRA	150.2004	*François DEGEORGE, François DERRIEN and Kent L. WOMACK* (lxxi): Quid Pro Quo in IPOs: Why Bookbuilding is Dominating Auctions
CCMP	151.2004	*Barbara BUCHNER and Silvia DALL'OLIO*: Russia: The Long Road to Ratification. Internal Institution and Pressure Groups in the Kyoto Protocol's Adoption Process
CCMP	152.2004	*Carlo CARRARO and Marzio GALEOTTI*: Does Endogenous Technical Change Make a Difference in Climate Policy Analysis? A Robustness Exercise with the FEEM-RICE Model
PRA	153.2004	*Alejandro M. MANELLI and Daniel R. VINCENT* (lxxi): Multidimensional Mechanism Design: Revenue Maximization and the Multiple-Good Monopoly
ETA	154.2004	*Nicola ACOCELLA, Giovanni Di BARTOLOMEO and Wilfried PAUWELS*: Is there any Scope for Corporatism in Stabilization Policies?
CTN	155.2004	*Johan EYCKMANS and Michael FINUS*: An Almost Ideal Sharing Scheme for Coalition Games with Externalities
CCMP	156.2004	*Cesare DOSI and Michele MORETTO*: Environmental Innovation, War of Attrition and Investment Grants

CCMP	157.2004	*Valentina BOSETTI, Marzio GALEOTTI and Alessandro LANZA*: How Consistent are Alternative Short-Term Climate Policies with Long-Term Goals?
ETA	158.2004	*Y. Hossein FARZIN and Ken-Ichi AKAO*: Non-pecuniary Value of Employment and Individual Labor Supply
ETA	159.2004	*William BROCK and Anastasios XEPAPADEAS*: Spatial Analysis: Development of Descriptive and Normative Methods with Applications to Economic-Ecological Modelling
KTHC	160.2004	*Alberto PETRUCCI*: On the Incidence of a Tax on PureRent with Infinite Horizons
IEM	161.2004	*Xavier LABANDEIRA, José M. LABEAGA and Miguel RODRÍGUEZ*: Microsimulating the Effects of Household Energy Price Changes in Spain

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	6.2005	*Valentina BOSETTI, Carlo CARRARO and Marzio GALEOTTI*: The Dynamics of Carbon and Energy Intensity in a Model of Endogenous Technical Change
IEM	7.2005	*David CALEF and Robert GOBLE*: The Allure of Technology: How France and California Promoted Electric Vehicles to Reduce Urban Air Pollution
ETA	8.2005	*Lorenzo PELLEGRINI and Reyer GERLAGH*: An Empirical Contribution to the Debate on Corruption Democracy and Environmental Policy
CCMP	9.2005	*Angelo ANTOCI*: 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
KTHC	12.2005	*Carla MASSIDDA*: Estimating the New Keynesian Phillips Curve for Italian Manufacturing Sectors
KTHC	13.2005	*Michele MORETTO and Gianpaolo ROSSINI*: Start-up Entry Strategies: Employer vs. Nonemployer firms
PRCG	14.2005	*Clara GRAZIANO and Annalisa LUPORINI*: Ownership Concentration, Monitoring and Optimal Board Structure
CSRM	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 Multihoming
CCMP	21.2005	*Barbara BUCHNER and Carlo CARRARO*: Regional and Sub-Global Climate Blocs. A Game Theoretic Perspective on Bottom-up Climate Regimes
IEM	22.2005	*Fausto CAVALLARO*: An Integrated Multi-Criteria System to Assess Sustainable Energy Options: An Application of the Promethee Method
CTN	23.2005	*Michael FINUS, Pierre v. MOUCHE and Bianca RUNDSHAGEN*: Uniqueness of Coalitional Equilibria
IEM	24.2005	*Wietze LISE*: Decomposition of CO2 Emissions over 1980–2003 in Turkey
CTN	25.2005	*Somdeb LAHIRI*: The Core of Directed Network Problems with Quotas
SIEV	26.2005	*Susanne MENZEL and Riccardo SCARPA*: Protection Motivation Theory and Contingent Valuation: Perceived Realism, Threat and WTP Estimates for Biodiversity Protection
NRM	27.2005	*Massimiliano MAZZANTI and Anna MONTINI*: The Determinants of Residential Water Demand Empirical Evidence for a Panel of Italian Municipalities
CCMP	28.2005	*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-VALIÑAS*: 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 İLKILIÇ* (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

CTN	37.2005	*Alessandra CASELLA and Nobuyuki HANAKI* (lxxii): Information Channels in Labor Markets. On the Resilience of Referral Hiring
CTN	38.2005	*Matthew O. JACKSON and Alison WATTS* (lxxii): Social Games: Matching and the Play of Finitely Repeated Games
CTN	39.2005	*Anna BOGOMOLNAIA, Michel LE BRETON, Alexei SAVVATEEV and Shlomo WEBER* (lxxii): The Egalitarian Sharing Rule in Provision of Public Projects
CTN	40.2005	*Francesco FERI*: Stochastic Stability in Network with Decay
CTN	41.2005	*Aart de ZEEUW* (lxxii): Dynamic Effects on the Stability of International Environmental Agreements
NRM	42.2005	*C. Martijn van der HEIDE, Jeroen C.J.M. van den BERGH, Ekko C. van IERLAND and Paulo A.L.D. NUNES*: Measuring the Economic Value of Two Habitat Defragmentation Policy Scenarios for the Veluwe, The Netherlands
PRCG	43.2005	*Carla VIEIRA and Ana Paula SERRA*: Abnormal Returns in Privatization Public Offerings: The Case of Portuguese Firms
SIEV	44.2005	*Anna ALBERINI, Valentina ZANATTA and Paolo ROSATO*: Combining Actual and Contingent Behavior to Estimate the Value of Sports Fishing in the Lagoon of Venice

(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

(lxix) This paper was presented at the Fourth EEP Plenary Workshop and EEP Conference “The Future of Climate Policy”, Cagliari, Italy, 27-28 March 2003

(lxx) This paper was presented at the 9th Coalition Theory Workshop on "Collective Decisions and Institutional Design" organised by the Universitat Autònoma de Barcelona and held in Barcelona, Spain, January 30-31, 2004

(lxxi) This paper was presented at the EuroConference on “Auctions and Market Design: Theory, Evidence and Applications”, organised by Fondazione Eni Enrico Mattei and Consip and sponsored by the EU, Rome, September 23-25, 2004

(lxxii) This paper was presented at the 10th Coalition Theory Network Workshop held in Paris, France on 28-29 January 2005 and organised by EUREQua.

2004 SERIES	
CCMP	*Climate Change Modelling and Policy* (Editor: Marzio Galeotti)
GG	*Global Governance* (Editor: Carlo Carraro)
SIEV	*Sustainability Indicators and Environmental Valuation* (Editor: Anna Alberini)
NRM	*Natural Resources Management* (Editor: Carlo Giupponi)
KTHC	*Knowledge, Technology, Human Capital* (Editor: Gianmarco Ottaviano)
IEM	*International Energy Markets* (Editor: Anil Markandya)
CSRM	*Corporate Social Responsibility and Sustainable Management* (Editor: Sabina Ratti)
PRA	*Privatisation, Regulation, Antitrust* (Editor: Bernardo Bortolotti)
ETA	*Economic Theory and Applications* (Editor: Carlo Carraro)
CTN	*Coalition Theory Network*

2005 SERIES	
CCMP	*Climate Change Modelling and Policy* (Editor: Marzio Galeotti)
SIEV	*Sustainability Indicators and Environmental Valuation* (Editor: Anna Alberini)
NRM	*Natural Resources Management* (Editor: Carlo Giupponi)
KTHC	*Knowledge, Technology, Human Capital* (Editor: Gianmarco Ottaviano)
IEM	*International Energy Markets* (Editor: Anil Markandya)
CSRM	*Corporate Social Responsibility and Sustainable Management* (Editor: Sabina Ratti)
PRCG	*Privatisation Regulation Corporate Governance* (Editor: Bernardo Bortolotti)
ETA	*Economic Theory and Applications* (Editor: Carlo Carraro)
CTN	*Coalition Theory Network*