Using Surveys to Compare the Public's and Decisionmakers' Preferences for Urban Regeneration: The Venice Arsenale

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Summary

In this paper, we illustrate how surveys can be used to elicit the preferences of the public and of policymakers and city officials for regeneration projects at urban sites. Our methodology uses rating exercises, coupled with conjoint-choice stated preferences for the general public and with ranking exercises for the public officials and other stakeholders, and is then applied to investigate alternative reuses of the Venice Arsenale, Italy, and their economic, environmental and social impacts. One interesting feature of the conjoint choice questions for members of the public is that the responses to these questions can be used to estimate the social benefits of regeneration projects, i.e., how much people are willing to pay for these urban transformations. Another advantage of our approach is that it can be used seek and foster broader public participation into urban decisionmaking processes.

Keywords: Land Use, Decision-Making, Cleanup, Sustainable Development, Local Economic Development, Choice Experiments

JEL Classification: R14

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USING SURVEYS TO COMPARE THE PUBLIC'S AND DECISIONMAKERS' PREFERENCES FOR URBAN REGENERATION: THE VENICE ARSENALE.

1. Introduction and Motivation

The concept of sustainable urban growth and economic development has drawn much recent attention among policymakers, communities and scholars.[1] The 1992 U.N. Conference on Environment and Development laid out directions for sustainable urban development in chapters 7 and 28 of Agenda 21 by stipulating that "by 1996, most local authorities in each country should have undertaken a consultative process with their population and achieved a consensus on a local Agenda 21 for their communities." This mandate spurred a large number of local planning initiatives, especially in the UK, Northern Europe, and in developing nations. More recently, attention has been given to urban renaissance and smart growth theories to establish a vision for cities founded on the principles of design excellence, social wellbeing and environmental responsibility (see for example Urban Task Force, 2005 and US EPA, 2001)

The goal to protect and conserve buildings, monuments, and landscapes of historical, cultural, architectural and spiritual value is currently an integral part of many urban sustainability programs, and is sanctioned by the 1996 Istanbul declaration on Human Settlements. At this time, several European cities are striving to meet these goals. The city of Venice is a prominent example of one such city. The city is plagued by wave

[1] There are several possible definition of the concept of sustainability, but one of the best known and most widely accepted among governments is that developed by the Brundtland Commission in 1987, which states that "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs." In turn, the concept of sustainability spans three main concerns—the environmental, social aspects, and economic activity and growth. For the UK government, for example, the concept at the heart of sustainability is the idea of ensuring better quality of life for everyone—both present and future generations. This requires meeting three goals: social progress, protection of the environment, prudent use of natural resources, high and stable levels of employment and economic growth (http://www.defra.gov.uk/environment/sustainable/index.htm).
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motion, erosion and subsidence problems, and water pollution. Its economy lacks diversification, since it relies heavily on tourism, and many areas are heavily congested with tourist flows.

Pursuing urban "renaissance" in neglected areas in Venice is complicated by the difficulty of updating infrastructure while protecting prized architectural, historical and cultural heritage buildings and the environment. The management of tourist flows and the redistribution of tourists and congestion in different parts of the city through the public transportation system may also play an important role in revitalizing neglected areas.

Recent urban planning initiatives have emphasized the need for regenerating several underutilized parts of the city, such as the Arsenale—the old shipbuilding yard—and have integrated regeneration proposals for this complex within plans for overhauling the transportation system and spurring economic growth while providing venues for preserving the cultural heritage of the city.[2] Many of these proposals are surrounded by controversy,[3] and this paper contributes to the discussion on the reuse of urban areas by proposing a survey-based approach capable of eliciting the preferences of both residents and stakeholders for reuse alternatives of neglected urban areas.

The purpose of this paper is two-fold. First, we illustrate the use of stated preference techniques for placing a value on redevelopment and reuse alternatives for the Venice Arsenale, an underutilized site with high historical, cultural and architectural significance. We accomplish this goal by developing a survey questionnaire based on

[2] In 2004, the City of Venice, as signatory of the Aalborg+10, agreed to the "Aalborg Commitments" designed to strengthen ongoing local sustainability efforts and to revitalise Local Agenda 21. The commitments require signatories to "ensure appropriate conservation, renovation and use/re-use of our urban cultural heritage."

[3] In recent years, the importance of the Arsenale has resulted in a heated debate on its possible new uses. Many architectural proposals have been submitted through international competitions.

Choice Experiments (CE) (see Louviere et al, 2000 or Hanley et al., 2001), which we administer to a sample of Venice residents, to provide estimate of the willingness to pay (WTP) for specific transformation of the Arsenale, and hence to conduct formal benefit-cost analyses of urban regeneration alternatives.

Second, we demonstrate how the views of residents can be compared with those of public officials and other stakeholders to inform the decisionmaking and the policy process. We attain this goal—a goal that is at the heart of Agenda 21—by developing and administering a second survey instrument to the latter group. The two survey instruments were crafted to allow multiple ways of comparing the preferences of the two groups.

Our research demonstrates that individuals *are* capable and willing to trade off attributes describing land use, the local economic impacts of alternative redevelopment projects at the Arsenale, and the cost of the transformation. We believe that this shows that stated-preference approaches *can* be successfully used by policymakers and planners seeking the public's input into the decisionmaking process.

Briefly, our surveys of residents and public officials point to the following findings. Residents are generally not opposed to regeneration projects and new uses for the Arsenale. However, people will *not* accept *any* transformation of the Arsenale. On the contrary, they have well-defined preferences for reuse. For example, they like projects that supply housing for residents, but they are much less favorable to hotels. People prefer alternatives that provide boat moorings for residents, fast transportation links between the Arsenale and the other parts of the city and the lagoon and regard job creation as very important. Public officials and other stakeholders place a high value on research activities and museums, dismiss boat berths as a priority, but much like

residents, believe employment is important, and so is the presence of fast transportation links. Public officials sound a common theme with residents when they judge hotels the least desirable reuse at the Arsenale. In sharp contrast with the preferences of residents, however, public officials consider housing an undesirable use of Arsenale.

The remainder of this paper is organized as follows. We provide background information about the Arsenale in section 2. Section 3 presents the methodology employed in our analysis. Section 4 focuses on the CE survey, describing the construction of the choice questions and the economic and econometric models. Section 5 presents the results of the two surveys and section 6 offers concluding remarks.

2. The Venice Arsenale

The Venice Arsenale is owned by the Italian government and is currently used primarily by the Italian Navy. About 45 hectares in size, the Arsenale accounts for about 15% of the area of the city of Venice, and is located in the Castello district (Figure 1). Founded in 1104, in its heyday the Arsenale employed roughly 20,000 workers in an assembly-line fashion and was said to produce one ship a day. At this time—in the second half of the 1500s—dockyard organization was restructured to attain both horizontal and vertical integration (Clark and Pinder, 1999).

Figure 1. The Venice Arsenale

The Arsenale started to decline after World War I, and continued to decline at an even faster rate after World War II, when its buildings were progressively abandoned. In 1983 the Soprintendenza per i Beni Ambientali ed Architettonici of Venice started a series of conservation works. At this time, the Italian Navy continues to own and occupy a large portion of the Arsenale. Research activities, shipbuilding, and museums occupy other areas, but many buildings and areas remain unutilized.

Clearly, the Arsenale has (i) a distinctive urban dimension, (ii) symbolic and historical value, (iii) distinctive architectural features, and (iv) an important role for the development strategies of the city (sustainable development). Furthermore, the Arsenale is one of the few sites in Venice with potential for a large-scale transformation. Until recently, the Italian Navy kept a command center at the Arsenale, but this was recently relocated to the city of Ancona, implying that addressing the regeneration of the Arsenale

means seeking a suitable reuse for a closed naval facility and waterfront (Clark and Pinder, 1999).

Another striking feature of the Arsenale is that because of its location within the city and because of its limited access via public transportation, it has remained outside of the traditional tourist routes. People are not allowed to enter the Arsenale, and until recently the only way for people to see the inside of the complex was to travel on the public transportation's Circle Line. Any changes in the use of the Arsenale imply, therefore, redefining entry and public transportation routes, and addressing issues of tourist flows and protection of highly prized structures with cultural and historical significance: The Arsenale was the place where the strength and military power of the Serenissima were built, and the Venice City Council recently sanctioned it inalienable heritage.

3. Methodology

Our study employs two questionnaires to elicit and compare the preferences for reuse options at the Arsenale of a sample of Venice residents and a group of public officials and other Arsenale stakeholders. The two questionnaires follow a similar pattern aimed at (i) providing respondents with some background information on the Arsenale (residents only), (ii) understanding the respondents' assessment of various aspects of living in Venice, (iii) eliciting respondent preferences for reuse options at the Arsenale.

We interviewed members of the general public using a self-administered computer questionnaire. We intercepted people at the Querini-Stampalia/FEEM Multimedia Library in Venice in two waves during the periods July 12-31, 2004 and

February 1-April 30, 2005. A total of 508 respondents started the survey, and 311 completed it. The questionnaire displayed a map showing that the Arsenale accounts for 15% of the total area of Venice, aerial pictures, photos of buildings and water areas inside the Arsenale, plus its history and future prospects.

The second survey questionnaire (a pen-and-paper questionnaire) was administered to 12 public officials and Arsenale stakeholders during the period June-August 2004. These are the most important local policymakers and stakeholders involved in the decisionmaking process for the future of the Arsenale, and include representatives from the Italian Navy, the city council, the local civic council, the Italian government, the heritage agency of the city of Venice (Soprintendenza per i beni artistici e storici di Venezia), the National Research Council, the University of Venice, rowing clubs, and private shipbuilding companies operating at the Arsenale. The persons we interviewed are the most important persons for their respective institutions (CEO, executive director, president, etc.) and have held their positions with the company or public office for an average of 16 years.

The questionnaire for public officials and stakeholders omitted photos and maps, as these respondents were presumed to be familiar with the site, but included a map with the land use at the Arsenale. While public officials and Arsenale stakeholders are familiar with the debate on the regeneration of the Arsenale, we felt it was necessary to introduce the notion of reuse in the questionnaire for the general public. In doing so, we pointed out that there are many large structures within the Arsenale that are currently not utilized, and that the City of Venice is considering regeneration alternatives for parts of the Arsenale that are not currently open to the public.

The core of our study consists in a series of exercises for eliciting the preferences for reuse alternatives at the Arsenale: We used rating exercises in both questionnaires, plus conjoint choice experiments in the general public survey, and ranking exercises in the stakeholders questionnaire. Specifically, our *rating exercises* ask respondents to indicate the intensity of their agreement or disagreement, on a scale from 1 to 5, with certain statements about the use of the Arsenale and priorities for the City and residents, such as whether an Arsenale reuse project should give the priority to housing, museums, or research centers, etc.

Public officials and stakeholders are also asked to *rank* possible reuse options at the Arsenale (hotels, housing, shipbuilding, museum and other cultural activities, research institutes, offices and the Navy). These are the same options that define the land use attribute in the conjoint choice questions administered to the general public. Ranking is a method often employed in stakeholders surveys for evaluating town and country planning strategies (Allen et al, 2001, Carmona et al, 2001, Sullivan et al, 2004, Burger, 2002). By contrast, Venice residents' preferences for reuse alternatives were elicited using a conjoint choice survey, as explained below.

4. The general public survey

A. Choice Experiments

Conjoint choice experiments (CE) are a survey-based technique frequently used to place a value on a good. It is a stated-preference method, in the sense that it asks individuals what they would do under hypothetical circumstances, rather than observing actual behaviors. In a typical CE survey, respondents are shown alternative variants of a

good described by a number of attributes, and are asked to choose the most preferred (Hanley et al., 2001). The alternatives differ from one another in the levels taken by two or more of the attributes.

CE has the advantage of simulating real market situations, where consumers face two or more goods characterized by similar attributes, but different levels of these attributes, and must choose whether they would buy one of the goods or none of them. Another advantage of the approach is that it can be used to study people's preferences for aspects or degree of environmental quality, quality of urban life, or urban regeneration that do not currently exist.

Through the appropriate statistical modeling of the responses to the choice questions, it is possible to estimate the marginal "price" of each attribute. In addition, if the "do nothing" or status quo option is included in the choice set, it is possible to estimate the full value (i.e., the willingness to pay [WTP]) of any alternative of interest. Marginal prices and WTP are important inputs into benefit-cost analyses of regeneration measures and programs.

Prior evidence suggests that CE is a well suited methodology to study the general public preferences for land use changes.[4] The methodology has been widely used to carry out quantitative analysis of the preferences of residents for urban transformations (Alberini et al, 2003, Katoshevski and Timmermans, 2001, Oppewal and Timmermans, 1999), regional planning decisions (Bateman et al, 2006, Campbell, 2006), or for modeling housing preferences (Wang and Li, 2004, Earnhart, 2002, Finn et al, 1992, Louviere and Timmermans, 1990, Orzechowski et al, 2005).

[4] See Louviere and Hensher (1982) for early application of choice experiments, and Adamowicz et al. (1994), Boxall et al. (1996), Bullock et al. (1998) and Hanley et al. (2001) for applications for the purpose of valuing natural resources and recreational amenities.

B. Construction of CE questions

When developing a CE survey, researchers must first select the *attributes* that define the good to be valued. This is usually done on the basis of what the goal of the valuation exercise is, literature review, prior beliefs of the researcher, and evidence from focus groups. For economic valuation and cost-benefit analysis purposes, one of the attributes must be the "price" of the commodity or the cost to the respondent of the program delivering a change in the provision of a public good. It is also important to make sure that the provision mechanism, whether private or public, is acceptable to the respondent, and that the payment vehicle is realistic and compatible with the commodity to be valued.

The next step is the selection of the *levels* of the attributes. These should be selected so as to be reasonable and realistic. Failure to do so may result in the rejection of the scenario and/or the choice exercise on the part of the respondent. The number of possible levels and attributes is necessarily limited by the sample size planned for the study (Louviere et al, 2000).

We conducted 11 focus groups to find out how well residents know the Arsenale, how much information needs to be provided on its history, architecture and current uses, and which attributes should be used to describe transformations of the Arsenale. The focus groups and initial survey development work suggested that the reuse transformations of the Arsenale are well captured by six attributes that describe both physical transformations of the site and economic, social and environmental impacts triggered by reuse projects: (i) land use, (ii) use of the water areas, (iii) quantity of new

buildings, (iv) access, (v) number of permanent new jobs created, and (vi) cost to the respondent. The attributes and attribute levels used in this study are summarized in table 1.

Table 1. Attributes and attribute levels of the choice experiments.

Attribute	
Land use (4 levels)	• Shipbuilding (in the Northeast), research, housing, offices, museum • Housing (in the Northeast), research, housing, museum, museum • Hotels (in the Northeast), museum, housing, research, museum • Shipbuilding (in the Northeast), research, housing, research, museum
Use of the water areas (2 levels)	• No new moorings • 200 new moorings
New buildings in the Northeast portion of the Arsenale (2 levels)	• No new buildings, • Presence of new buildings on 25% of the allowable area
Access (fast transportation links with other areas of Venice, the airport, the mainland, other islands) (2 levels)	• Available • Not available
Number of new jobs created (3 levels)	150, 250, 350
Cost to the respondent (4 levels)	25, 50, 100, 150

We formed the different levels of the land use attribute by dividing the Arsenale into five areas, as shown in figure 2, and then assigning to each of these portions one of the following uses: hotels, housing, shipbuilding, museums and other cultural activities, research institutes and laboratories, and offices. We created a total of four possible land use combinations.

Figure 2. The graphical description of the attribute land use.

(Note: this image shows LANDUSE4, with shipbuilding in the northeast Arsenale, research in the North Arsenale, research in the West Arsenale, and museums in the South and SouthEast Arsenale.)

Regarding the use of basins and waterways within the Arsenale, we posited two options: 200 new moorings, or none at all. The attribute "new buildings" takes one of two possible levels: (i) no new buildings, or (ii) new buildings in the 25% of the area that is currently allowed by the law to have new construction. The access attribute refers to the possible presence of new fast links between the Arsenale and other parts of the city of Venice, the airport, the mainland and other islands of the Lagoon. This attribute takes one of two possible values: the new fast connections are either present, or absent.[5] The number of permanent new jobs created takes on a value of 150, 250, or 350. Finally, there are four possible values for the cost of the project to the respondent: 25, 50, 100, and 150 Euro, respectively. This cost would be incurred as an addition to the respondent's income tax for the year 2004 (or 2005, for the second wave of surveys). The income tax is a Regional income tax.[6]

[5] The City of Venice is currently considering the construction of an underground rail system below the seabed that would connect the airport with the Arsenale. Because of the controversy surrounding this proposal, we removed any mention of the so-called *Sublagunare* in our questionnaire, and opted for the less politically charged "fast links."

[6] Our scenario proposes a Regional tax because evidence from focus groups suggested that people would deem a project of this size too small and geographically circumscribed to justify a national tax, and too

Respondents engaged in a total of four choice exercises where they had to choose between a transformation alternative A, another transformation B, and the option of not transforming the Arsenale at all (the "status quo"), in which case no additional taxes are incurred. To familiarize the respondent with the alternatives and the task of choosing between them, we first describe the status quo using a 2D rendition and our six attributes. Subsequent screens use similar graphical displays to present pairs of hypothetical transformations. To save space on the screen and better describe the projects, respondents are offered the option to view the status quo by clicking a button at the top of the screen. This is followed by the choice question, which reads as follows: "If you had to choose between the above described reuse projects and keeping the Arsenale as it is currently, which would you choose?" The possible responses are "project A," "project B," and "keeping the Arsenale as it is." An example of CE question is shown in figure 3.

To create the pairs of alternative regeneration projects, we first created the full factorial design, i.e., all of the possible combinations of attribute levels. This gave a total of 384 reuse alternatives. We discarded combinations that were not feasible or credible and then randomly selected two of these alternatives, but discarded pairs containing dominated or identical alternatives. Finally, we formed a total of 32 sets of four pairs each, making sure that the same pair was not repeated within a set. Individuals were randomly assigned to one of these sets.

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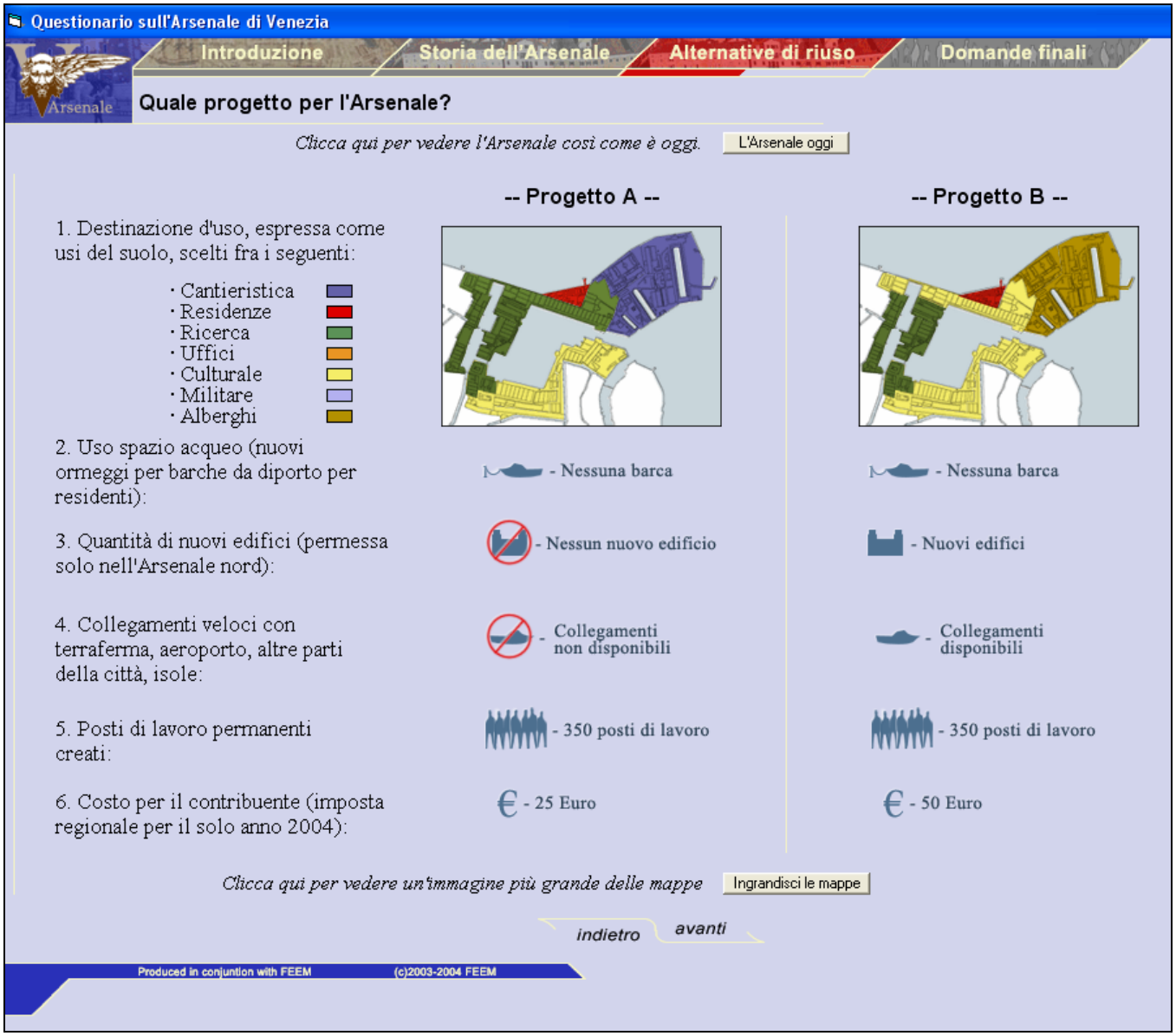
large for a strictly local tax. (The Region is a jurisdiction that has powers and limitations similar to those of the State in the United States or the Province in Canada.)

Figure 3. Example of the alternative projects in the Choice Experiments.



C. The Random Utility Model

To motivate the statistical analysis of the responses to CE questions, we assume that the choice between the alternatives is driven by the respondent's underlying utility. The respondent's indirect utility is comprised of two components. The first component is deterministic, and is a function of the attributes of the alternatives, characteristics of the individuals, and a set of unknown parameters, while the second is an error term. We further assume that the deterministic component of the indirect utility is linear in the attributes of the alternatives and residual income. Formally,

$$V_{ij} = \left[\mathbf{x}_{ij}\boldsymbol{\beta}_1 + (y_i - C_{ij})\beta_2\right] + \varepsilon_{ij} \tag{1}$$

where the subscript i denotes the respondent, the subscript j denotes the alternative, **x** is the vector of attributes that vary across alternatives (or across alternatives *and* individuals), y is income, C is the cost of the alternative, and ε is an error term that captures individual- and alternative-specific factors that influence utility, but are not observable to the researcher. Equation (1) describes the random utility model (RUM).

We posit that when faced with K alternatives in a CE question, the respondent chooses the one that gives him or her the highest utility. If the error terms ε are independent and identically distributed and follow a standard type I extreme value distribution, the probability that respondent i picks alternative k out of K alternatives is:

$$\Pr(k) = \frac{\exp(\mathbf{w}_{ik}\boldsymbol{\beta})}{\sum_{j=1}^{K}\exp(\mathbf{w}_{ij}\boldsymbol{\beta})} \tag{2}$$

where $\mathbf{w}_{ij} = \begin{bmatrix} \mathbf{x}_{ij} \\ C_{ij} \end{bmatrix}$ is the vector of the attributes of alternative j, including cost *C*, and $\boldsymbol{\beta}$ is equal to $\begin{bmatrix} \boldsymbol{\beta}_1 \\ -\beta_2 \end{bmatrix}$. We structured our choice questions so that in each choice task respondents must choose between two alternative hypothetical reuse projects and the status quo. This means that K=3 for each of our choice questions.

Equation (2) is the contribution to the likelihood in a conditional logit model. Assuming that the responses to the choice questions are uncorrelated within the same respondent and across respondents, the full log likelihood function of the conditional logit model is:

$$\log L = \sum_{i=1}^{n} \sum_{m=1}^{4} \sum_{k=1}^{3} y_{ik} \cdot \log \Pr(i \text{ chooses } k \text{ in question } m), \tag{3}$$

where y_{ik} is a binary indicator that takes on a value of 1 if the respondent selects alternative k, and *m* denotes the choice question. Once model (3) is estimated using the method of maximum likelihood, the rate of tradeoff between any two attributes is the ratio of their respective β coefficients. The marginal price of each attribute is computed as the negative of the coefficient on that attribute, divided by the coefficient on the cost variable. The willingness to pay for a regeneration alternative is computed as:

$$WTP_i = -\frac{\mathbf{x}_i \hat{\boldsymbol{\beta}}}{\hat{\beta}_2}, \tag{4}$$

where **x** is the vector of attributes describing the commodity assigned to individual i.

The conditional logit model described by equations (2)-(3) is easily amended to allow for heterogeneity among the respondents. Specifically, one can form interaction

terms between individual characteristics, such as age, gender, education, etc., and all or some of the attributes, and enter these interactions in the indirect utility function.[7, 8]

Regarding the signs of the coefficients in the indirect utility function, we expect the marginal utility of income β_2 to be positive (which means that the coefficient on cost should have a negative sign in the output of our conditional logit models). Likewise, we expect people to attach a positive utility to the number of permanent jobs created through a proposed transformation project. We do not have any a priori expectations about people's tastes for mooring spaces at the Arsenale and for fast transportation links with the mainland, the airport, other parts of Venice and islands of the Lagoon. We reasoned that while some people may be pleased about faster connections, others may be afraid of the possible inflow of tourists and of the disruption of the character of Castello, the *Sestiere* where the Arsenale is located. LANDUSE is another attribute for which we cannot offer a priori expectations.

5. Data and Results

A. The Sample of Residents

Because our sample for the general population was recruited from the users of the Querini-Stampalia/FEEM Multimedia Library, we cannot claim that it is representative of

[7] Whether or not interaction terms are included, implicit in the conditional logit model is the assumption of Independence of Irrelevant Alternatives (IIA), which states that the ratio of the odds of choosing any two alternatives depends only of the attributes of the alternatives being compared, and is not affected by the attributes of other alternatives. IIA imposes restrictive substitution patterns among the alternatives: Specifically, a change in the attributes of one alternative changes the probabilities of the other alternatives proportionately to satisfy the conditional logit's requirement that the ratio of these probabilities remains the same (Train, 2003). Researchers need to worry about violations of this assumption when K, the number of alternatives in the choice set, is at least 3.

[8] Respondents heterogeneity can also be accommodated by adopting a random coefficient logit model (see Train, 1999). The random coefficient logit model does not impose the IIA, and has the additional advantage of allowing for unobserved heterogeneity resulting in different marginal utilities across respondents.

the population of Venice. Our first order of business is, therefore, to examine the characteristics of these respondents. About 52% of our respondents are males, and the average age is 32 years. Household income is on average 29,741 euro a year, and median income is 20,000 euro a year. Roughly 9% of our respondents are married, and the average household size is 3.35 people. Over 42% of them are students, 25% are gainfully employed, 14.8% are currently looking for a job, about 4% have retired from the workforce, and homeowners account for the remaining 0.3%. In our sample, about 47% of our respondents has received a university degree (laurea).

Official statistics report that the 9.4% of the residents of Venice has a college degree, suggesting that our sample is more educated than the population of Venice. We do not have city-wide figures for income and household size, but household income in our sample is in line with mean household income in Northern Italy (€32,774 in 2002, Banca d'Italia, 2002). The household size in our sample is slightly larger than the average household size in Northern Italy (2.58 persons). Finally, official statistics for the Province of Venice imply that our sample is younger than the population at large (32 years on average versus 42). It is clear that the sample's share of students is much greater than the population's share. In terms of professional and educational background, however, our sample is similar to the current policymakers and officials of the City of Venice. Age and education considerations suggest that our respondents might be expected to be similar to the decisionmakers and city officials of the near future.

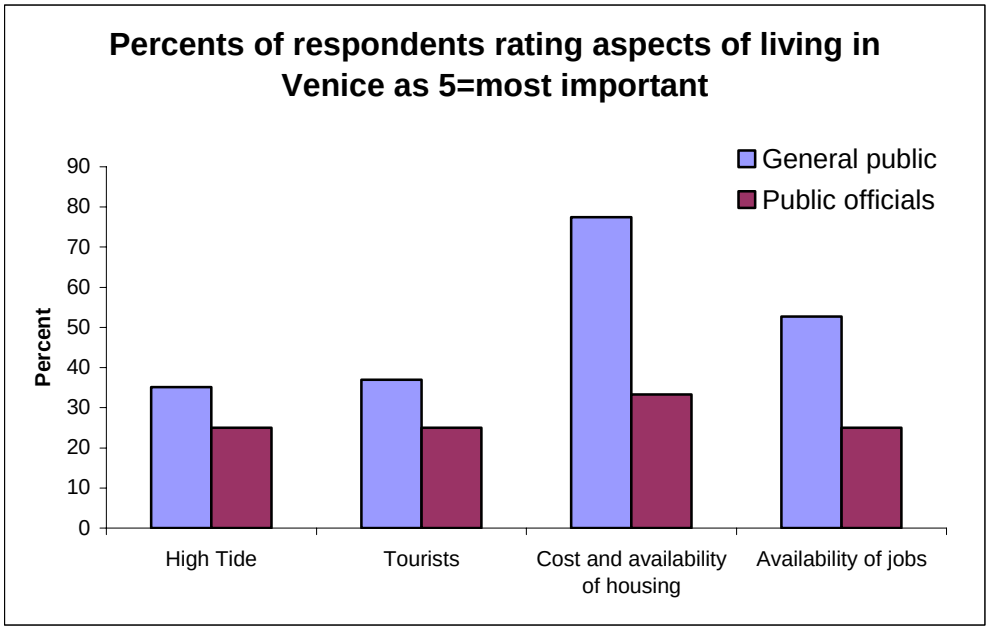
The vast majority of our respondents (88.1%) live in Venice and about 30% of our Venice-based respondents live in Castello, the *sestiere* (district) where the Arsenale is located. Regarding the Arsenale, more than 50% report that their knowledge of it is only

poor or fair at best. Only about 2.9% of the sample claim to have an excellent level of knowledge of the Arsenale. This provides ex post support for our decision to describe its history, state of conservation, owners/leasers and current use in our survey questionnaire.

B. Comparing Public Officials' and the General Public's Preferences

As shown in figure 4, when queried about issues that affect the quality of life in Venice and their overall experience living in this city, the two groups of respondents share similar views about high tides and tourists, but differ in their opinions on the costs and availability of housing and the availability of jobs. Specifically, 77% and 53% of the general public finds the cost and supply of housing and the availability of jobs to be "very important" respectively, compared to only 33.3% and 25% of the public officials respectively.

Figure 4. Respondents opinion about aspects of living in Venice.



Turning to the Arsenale, the two groups of respondents show both similarities and differences in their preferences for its reuse. Figure 5 displays the percentage of respondents that selected either “completely agree” and “agree” or “completely disagree” and “disagree” with several statements about the reuse of the Arsenale. Bars in the positive portion of the vertical axis represent percentages in strong or very strong agreement; bars in the negative part of the vertical axis represent percentages in strong or very strong disagreement. Clearly, the general public prefers reuse projects that provide housing, while public officials oppose them. Projects that offer research centers, new museums, additional jobs and fast links between the Arsenale and other parts of the city of Venice, the airport, the mainland and other islands of the Lagoon are appreciated by both groups, with the public officials being more in favor of these alternatives than the general public. The two groups concur that hotels are undesirable: 88.4% of the general public and 83.3% of public officials respectively state that they disagree or completely disagree with giving priority to hotels at the Arsenale.

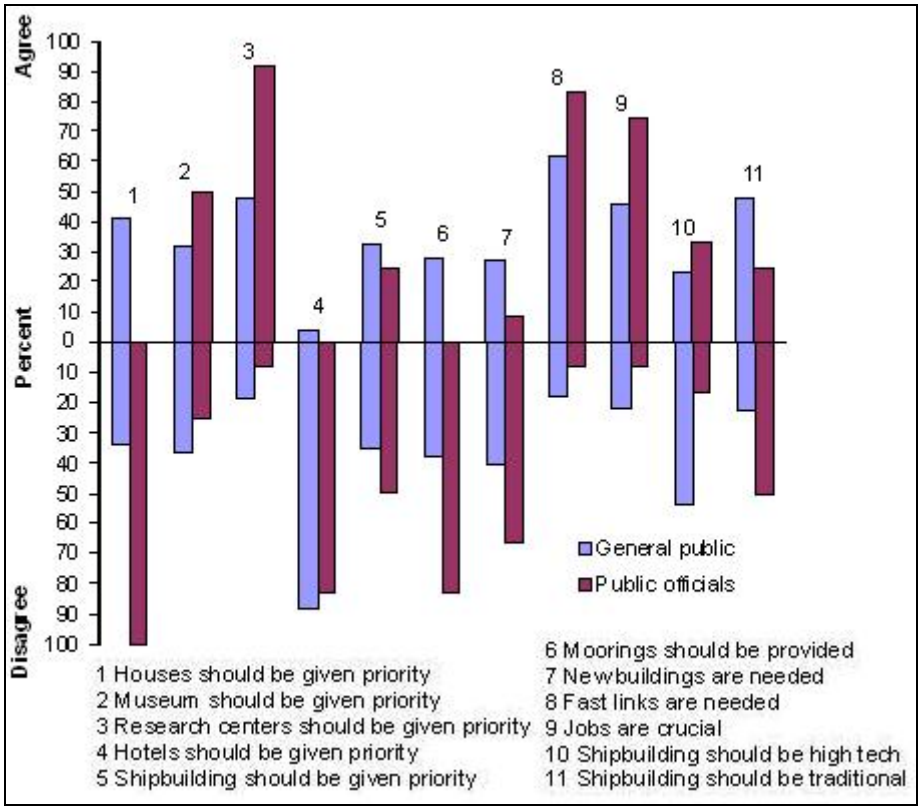
Public officials also strongly oppose the statement that shipbuilding activities should be given priority in a reuse project (only 25% of them agrees or completely agrees with this statement). By contrast, the general public seems to be much more divided on this statement: 28.3% of the respondents agrees or completely agrees with the statement on the importance of the presence of shipbuilding, while 35% disagrees or completely disagrees with it. Our two groups of respondents express slight disagreement with the construction of new buildings, with only about 25% of the general public and 8% of public officials agreeing or completely agreeing that the optimal reuse of the Arsenale

should entail the construction of new buildings. A similar pattern is also observed with the opinions regarding the provision of new moorings, with only about 28% of the general public and no public officials agreeing that new moorings should be a priority in a reuse project.

When asked which type of shipbuilding activity should be carried out at the Arsenale, 53.8% of the general public disagree/strongly disagree with the notion that high-tech shipbuilding (e.g., the MOSE project[9]) should be taking place on the premises, and over 47% agree strongly/very strongly that the priority should be given to traditional shipbuilding activities. Different views emerge among the public officials, where only 16.6% of them disagree or strongly disagree with the assertion that high-tech shipbuilding should be developed at the Arsenale, and only 25% agree or strongly agree that traditional shipbuilding activities should take place.

[9] MOSE stands for Modulo Sperimentale Elettromeccanico, and is a system of inflatable floodgates to prevent seawater from flooding into Venice's three inlets into its Lagoon. The floodgates would be inflated only when tides and storms cause a dramatic sea level rise.

Figure 5. Residents' and public officials' priorities for projects at the Arsenale.



Stakeholders and public officials were further asked to rank the possible reuse activities at the Arsenale, assigning a value of 1 to the most preferred activity, and 7 to the least preferred one. Table 2 confirms the answers we collected in the previous series of agreement/disagreement statements: for this group, research centers are the most preferred activity, followed by museums, shipbuilding, offices and the Italian Navy. The construction of new housing and hotels are once again the least preferred reuse options.

Table 2. Public officials average ranking of preferences for the activities to be placed at the Arsenale.

Activity	**Average rank**
Research centers	1.92
Museums	2.33
Shipbuilding	3.08
Offices	4.00
Italian Navy	4.67
Housing	5.42
Hotels	6.25

C. Responses to the CE questions.

In analyzing the CE answers, our first order of business was to check whether our sample of the general public understood the choice exercises. Our respondents selected one of the two regeneration alternatives for the Arsenale instead of the status quo in over 85% of the choice occasions. When queried about the reasons for their answers to the choice questions, only about 6.1% of the respondents indicated that they only looked at the graphical representation of the regeneration projects, and only 4% stated that they are opposed to any transformation of the Arsenale. More than 90% of the respondents felt that they understood the attributes of the regeneration projects, and found the visuals and the language of the questionnaire clear. This suggests that (i) our respondents understood the choice questions, (ii) most respondents were trading off the attributes of the alternative projects as posited by the random utility model (equation (1)),[10] and that (iii) in general people are not opposed to transformations and new uses for the Arsenale.

[10] We also checked whether some respondents always selected the option on the left, or the option on the right, or the status quo as their answers to all choice questions. We found 39 individuals out of 311 (12.54%) who picked the option on the left in all choice questions, 14 (4.50%) who picked the option on the right in all choice questions, and 23 (7.40%) who picked the status quo in all four choice questions. These percentages are generally modest. Viscusi et al. (1991) consider this response pattern suspect, but in our view it is not necessarily incompatible with the random utility model and with the assumption that people trade off the attributes of the alternatives being compared. For good measure, these respondents are excluded from the sample we use to fit our conditional logit equations. We further excluded from the statistical analysis of the CE the observations of people who took less than 5 minutes or more than two

This latter conclusion is also confirmed by the econometric models. Specification (A) of table 3, which displays the results of a conditional logit model of the responses that includes only a status-quo-specific intercept, shows that this coefficient is negative and strongly significant, implying that individuals choose the status quo (keeping the Arsenale as it is now at no extra cost to the taxpayers) much less frequently than the other alternatives.

Our respondents, therefore, consider transformations of the Arsenale appealing and *are* willing to incur costs for its regeneration. However, people will *not* accept *any* transformation of the Arsenale. On the contrary, they have well-defined preferences for reuse. For example, they like the project that supplies housing for residents, but are much less favorable to hotels. Specification (B) explains this point: When we drop the status quo dummy and include the variables representing the attributes (including dummies for the four types of land-use configurations),[11] the coefficients on the land use dummies are relatively large, and two—those on LANDUSE2 and LANDUSE3, which entail housing and hotels, respectively, in the northeast part of the Arsenale and research activities and cultural activities in the remaining areas—are individually statistically significant.

The coefficient of LANDUSE2 is positive, suggesting that, all else the same, our respondents are more likely to accept the project that provides new housing in the northeast area of the Arsenale, research centers in the northwest part and cultural activities in the remaining areas. The coefficient of LANDUSE3 is negative, indicating

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hours and a half to take the survey (15 persons); those by persons who stated that randomly selected the alternatives during the conjoint choice questions (12 persons); those by subjects who stated that the members of their family are more than 10 (1 person). In the end, our cleaned sample was comprised of 227 respondents (some respondents failed more than one of our check tests).

[11] In this specification, the status quo is represented by a vector where all the attributes are set to zero.

that our respondents tend to turn down projects with new hotels in the northeast Arsenale, cultural facilities in the northwest and research centers in the West Arsenale.

The coefficients of the LANDUSE1 and LANDUSE4 are large, but individually insignificant. This implies that, absent any other policy offering, respondents are indifferent between the status quo and projects with shipbuilding in the Northeast Arsenale. Since both LANDUSE1 and LANDUSE4 offer shipbuilding in the northeastern area of the Arsenale, and at present this area is indeed partly occupied by shipbuilding operations, we speculate that perhaps respondents did not perceive these alternatives as very different from the status quo.[12]

Regarding the other attributes, the coefficient on the tax is negative and significant, and that on the number of jobs positive and significant, as expected. People seem therefore to regard job creation as very important, and behave in a manner consistent with the economic paradigm, in that their likelihood of favoring a regeneration project declines with the cost of the project. We did not have any prior expectations for people's appreciation of fast transportation links with the mainland, the airport, other parts of Venice and islands of the Lagoon. We reasoned that while some people may be pleased about faster connections, others may be afraid of the possible inflow of tourists and of the disruption of the character of Castello, the *Sestiere* where the Arsenale is located. The empirical evidence is that people *do* value fast transportation links. Likewise, people tend to favor alternatives that imply new construction in the northwestern portion of the Arsenale.

[12] Although only two out of four coefficients on the land use dummies are individually statistically significant, a likelihood ratio test of the null hypothesis that these four coefficients are all equal to zero rejects the null soundly. The likelihood ratio statistic is 98.04 (p value < 0.00001).

The coefficients of the conditional logit model imply that, *ceteris paribus*, our respondents prefer regeneration projects that entail new buildings as well as new moorings, even though, as shown in figure 5, they generally do not think that in a regeneration project of the Arsenale priority should be given to the construction of new buildings or to new moorings.

In specification (C) of table 3, we explore heterogeneity of preferences across respondents and report the results of a conditional logit model that includes interactions between selected attributes and individual characteristics of the respondents.[13] We test whether persons who judged tourism, housing, and fast transportation links important valued the land uses with hotels and housing and alternatives with fast transportation links differently from other individuals. As shown in specification (C), these expectations are indeed borne out in the data, in the sense that people who worry more about tourists dislike the option with hotels even more than other people, while people for whom housing is important tend to attach a higher marginal utility to land use with housing. Finally, those persons who deem fast transportation links important are also more likely to select a project that entails the presence of fast links between the Arsenale and other areas of Venice, the airport, the mainland, and the other islands. These results lead us to conclude that the responses to the choice questions are internally consistent.

[13] We also experimented with random coefficient logit models, but found little evidence of random coefficients. We ran two specifications of the random coefficient logit. In the first, the coefficients on the land use attributes were treated as fixed and those on the other attributes as random variables. In the second, we reversed roles. Both specifications treated the coefficient on the tax as fixed (not as a random variable).

Table 3. Conditional logit model of the responses to the choice questions. Total number of obs 892.

	Specification A		Specification B		Specification C	
	coeff	**t -stat**	**Coeff**	**t -stat**	**coeff**	**t -stat**
STATUSQUO	-1.5838	-13.7415				
MOORINGS			0.2438	2.0807	0.2259	1.8985
NEW_CONS			0.2808	2.1674	0.2646	2.0237
CONNECTI			0.7673	7.1876	0.6311	4.9854
JOBS			0.0045	3.7096	0.0045	3.6275
TAXES			-0.0059	-3.7346	-0.0060	-3.7496
LANDUSE1			0.2725	0.7474	0.3034	0.8247
LANDUSE2			0.7762	2.6638	0.3495	1.0870
LANDUSE3			-0.9163	-2.2960	-0.6451	-1.5760
LANDUSE4			0.4768	1.2407	0.5315	1.3708
LANDUSE3 * (DUMMY TOURISTS)[1]					-0.7404	-2.3349
LANDUSE2 * (DUMMY ABITARE)[2]					1.1860	3.9800
CONNECTI * (DUMMY LINKS)[3]					0.3948	1.9814
					0.2259	1.8985
log likelihood	-836.8628		-755.4047		-742.0907	

[1] DUMMY TOURISTS = dummy variable that takes on a value of 1 if a respondent rates the presence of tourists as 4 or 5 on a scale where 1 = not important at all and 5 = very important.
[2] DUMMY ABITARE = dummy variable that takes on a value of 1 if a respondent rates the cost of housing as 4 or 5 on a scale where 1 = not important at all and 5 = very important.
[3] DUMMY LINKS = dummy variable that takes on a value of 1 if a respondent rates the presence of fast transportation connections as a prerequisite for the optimal reuse of the Arsenale as 5 on a scale where 1 = not important at all and 5 = very important.

D. Implications from the Conditional Logit Model

Our CE results allow us to get a sense of the appeal of specific hypothetical projects and of the WTP to implement such projects. Consider two projects, A and B, that are identical in every aspect, but land use. Assume that both have no moorings, both have new buildings and fast transportation links, 250 new jobs, and cost €50. Further assume that the only difference between A and B is in the land use: A has LANDUSE2, while B LANDUSE3. The conditional logit model of specification (B) predicts that the likelihood of choosing the status quo is 0.055, whereas the likelihood of choosing A is 0.798 and that of choosing B is 0.147. If project B were to have LANDUSE1, the probability of

choosing the status quo is 0.041, that of choosing A is 0.598 and that of choosing B is 0.361. In other words, the likelihood of choosing B has more than doubled when LANDUSE3 is replaced by LANDUSE1.

Using the results of specification (B), we can calculate the marginal values of the attributes. To an individual respondent, the marginal value of the presence of mooring spaces is €41.55, that of new buildings in the northeast Arsenale is €47.87, fast transportation links are worth €130.80, LANDUSE1 (shipbuilding and offices) per se is €46.45, LANDUSE2 (housing) is €132.32, LANDUSE4 (shipbuilding and research) is €81.27, and each new job is worth €0.77. By contrast, the marginal WTP for LANDUSE3 (hotels) is €-156.20, implying that people would have to be compensated to accept this combination of land uses.

Individual respondents are willing to pay €504.7 for the alternative A described above, which has housing with new construction and fast transportation links, no mooring spaces, and 250 new jobs. This is a one-time WTP figure. To obtain the total benefits of this project, one would need to multiply these WTP figures by the number of taxpayers (households) in the city of Venice (116,226 households, if Mestre is included), and would then need to add the WTP for the representative resident of all other areas of the Veneto Region, multiplied by the number of taxpayers (households) in all other areas of the Veneto Region (1,598,115 households).[14] The WTP Project A for the residents of Venice alone is €39M.

Project A resembles many of the characteristics of the PRUSST, the regeneration project proposed by the city of Venice, except that the latter also entails an area for the

[14] This is because the scenario instructed respondents to think of a Regional addition to their income tax for 2004. We did not survey persons that live in other areas of the Veneto Region, so we do not know what the WTP of these persons is.

Navy, which is estimated to cost about €140M. Our results show that if we only consider the WTP of the population of Venice, the PRUSST project would not pass a cost-benefit analysis.

Our analysis has also shown that our respondents tend to turn down projects that entail the construction of new hotels at the Arsenale. Therefore, it is of interest to identify a mix of levels of the attributes that would make a project with hotels more acceptable.

Consider two projects, C and D, both described by the absence of moorings, the presence of new buildings and fast transportation links, 250 new jobs, and a cost of €150, but that differ for the land use. Project C has LANDUSE3 (hotels) and project D LANDUSE1 (shipbuilding and offices). The likelihood of choosing the status quo is 0.137, whereas the likelihood of choosing project C is 0.201 and that of choosing project D is 0.662. C is thus somewhat more attractive than the status quo.

Suppose now that project C offers fast transportation links, mooring spaces, and further reduce its tax to €25, while leaving D unchanged. With this mix, the probability of selecting the status quo is 0.102, whereas the likelihood of choosing D is 0.496 and that of choosing project C increases to 0.402. Clearly, the two regeneration alternatives C and D are now much closer. Our model predicts that our respondents would be practically indifferent between projects C and D (with a very slight preference for C) if project C entails 50 new more jobs, for a total of 300 jobs, versus project D's 250. Under these assumptions, the probability of selecting the status quo is 0.46, the likelihood of choosing D is 0.45, and the chance of choosing the status quo is 0.09.

6. Discussion and Conclusions

The purpose of our study is to illustrate how survey-based approaches can be used to elicit the preferences of the public for regeneration alternatives for the Arsenale, a historic site with great symbolic significance for the city of Venice, and how these preferences can be compared with those of public officials and other participants in the decisionmaking process. Our surveys have shown that both groups have well-defined preferences for the reuse of the Arsenale and are capable of making choices involving land use and sustainable economic activities.

Our survey approach is based on (i) CE questions, which are interpreted within a random utility model and statistically modeled using conditional logit equations (for the residents), and (ii) rating and ranking tasks (for the residents, the public officials and other stakeholders). The information provided by the responses to the conjoint choice experiments is a useful input into cost-benefit analyses of regeneration projects, because it allows us to compute the willingness to pay—and hence the benefits of—specific urban regeneration alternatives. On their part, (ii) can be used to check how well the preferences of public officials and other stakeholders match those of the public.

The multiple elicitation approach makes it very clear that both groups—the residents and the public officials/stakeholders—care about several aspects of urban regeneration and sustainability, and that in some cases their views are sharply different. For example, the stakeholders and public officials group is strongly against the construction of housing. Our sample of residents was evenly distributed among all response categories when we queried them about housing using a Likert scale format, but clearly favored projects with housing in the CE questions. Both groups are clearly against a reuse project that entails the construction of new hotels, favor the creation of research

centers, and agree on the importance of the number of new jobs created and on fast transportation connections with other areas of Venice, the Lagoon and the mainland.

These findings are generally confirmed by the results of the conditional logit model of the responses to the CE questions (for residents) and the ranking of reuse options (public officials and stakeholders). While our results should be interpreted with caution (our sample of public officials and other stakeholders provides a good coverage of the universe of their respective government agencies and entities, but we cannot claim that the users of the Multimedia Library are representative of the population of Venice residents), we believe that our results are consistent and encouraging, and that our approach could be implemented, with the appropriate adaptations, at other locales facing similar urban regeneration prospects.

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