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Remoundou, Kyriaki and Adaman, Fikret and Koundouri,
Phoebe and Nunes, Paulo A.L.D.

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**Are Stated Preferences Sensitive to Funding Sources?
A Tax Reallocation Scheme to Value Marine Restoration**

Kyriaki Remoundou, 76, Patission Street, Athens 104 34, Greece,

Fikret Adaman, Istanbul, 34342, Turkey

Phoebe Koundouri, 76, Patission Street, Athens 104 34, Greece

Paulo A.L.D. Nunes, Isola di San Giorgio Maggiore, 30124 Venice, Italy_*

* Kyriaki Remoundou, Miss , Phd Candidate, Department of International and European Economic Studies, Athens University of Economics and Business

Fikret Adaman, Prof, Professor of Economics, Boğaziçi University, Istanbul, Turkey

Phoebe Koundouri, Dr, Assistant Professor in Economics, Department of International and European Economic Studies, Athens University of Economics and Business

Paulo A.L.D. Nunes, Prof., Professor of Environmental Valuation, Department of Economics, Cà Foscari University of Venice and Fondazione ENI Enrico Mattei

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Abstract

This paper uses a tax revenues reallocation scheme as the payment vehicle in a choice experiment to value marine restoration in the Black Sea. Two reallocation treatments are administered; one proposing to reduce current public expenditures on renewable energy projects and the other, the training budget for civil servants. We examine the sensitivity of preferences and valuation estimates to the budget source used to finance the restoration program. Results reveal that preferences and marginal rates of substitution significantly differ between the two treatments. In the civil servants' budget reallocation treatment, the reallocation coefficient is positive, implying that redistribution is utility-enhancing.

Key words: choice experiment, payment vehicle, tax revenues reallocation, marine resources, Black Sea

1. Introduction

The importance of the payment vehicle selection in the stated preference literature has been acknowledged since the early contingent valuation studies and still presents one of the major challenges for stated preference practitioners (Cummings et al 1986; Mitchell and Carson 1989; Bateman et al. 2002; Ivehammar 2009). Typically, specific taxes that aim to raise funds for the provision of a certain good have been employed as the payment vehicle in applications. However, payment biases that arise when respondents object to the payment mode proposed in a valuation scenario—in the form of either reacting strategically or protesting the valuation exercise itself—are often reported when mandatory schemes, such as taxes, are employed, cautioning for more research on the selection of payment vehicles (Mitchell and Carson 1989; Morrison et al 2000).

Responsively, alternative payment mechanisms have been applied including entrance fees, donations, increases in utility bills, and more recently tax reallocation schemes (Brown et al. 1996; Champ et al. 1997; Garrod and Willis 1999; Wisser 2007; Bergstrom et al 2004; Kontoleon et al 2005; Nunes and Traversi 2009). Especially in middle- and low-income settings of developing and transitional economies, high protest responses against new taxes are to be expected, given the limited ability of respondents to pay due to budget constraints but also given feelings of unfairness when additional tax loads are charged to low income people (Bennett and Birol 2010). The selection of the payment vehicle thus requires special attention.

In this paper a choice experiment is used to value a marine restoration programme in the Western Black Sea shelf. Research was designed to support the Governments of the countries bordering the Black Western Shelf of the Black Sea in implementing the European Marine Strategy Framework Directive¹. The experiment was conducted in coastal settlements of Turkey and Ukraine, two middle-income states that are, according to the World Bank, in a transition process of developing and updating their national policies towards sustainable marine resource management and environmental protection². Given the middle-income context of our study, a tax revenues reallocation scheme is adopted as the payment vehicle to minimize strategic behavior and protest responses. Protest responses were a major concern at the designing stage of this study since even recently in a contingent valuation study in Turkey conducted by Adaman et al. (2011) it is reported that one third of the sample refused to make any contribution in the form of additional taxes and for the large majority this was due to poor financial means.

Under a tax reallocation scheme, the good to be valued is financed through the reallocation of public money currently being spent on other public goods (Bergstrom et al 2004; Kontoleon et al 2005; Nunes and Travisi 2009). The value of the good in question is thus the amount people are willing to forgo of the alternative good for an increase of the said good's provision. This is analogous to the willingness to pay (WTP)—the amount of income the respondent is willing to forgo for an improvement in the good—elicited when payment vehicles involving additional payments are employed. Given the unpopularity of new taxes, a redistribution of existing tax revenues can be an appealing public policy instrument, and is often employed in real-world decision-making. Especially in light of the current financial crisis, the need to

rationalize the allocation of public expenditures instead of imposing new taxes is often stressed. Finally, reallocation schemes are not subject to free-riding problems associated with voluntary payment schemes such as donations (Champ and Bishop 2001). The relative merits of a reallocation scheme as a payment instrument in valuation studies are even more pronounced in middle- and low-income countries, where valid welfare estimations may be confounded by budget constraints when payment vehicles that exert extra budget pressure on respondents are employed.

Although there are several benefits associated with tax reallocation schemes, their use is not widespread mainly because the rather limited literature has yet to adequately address validity issues. One major concern is the implication for the valuation exercise of the alternative public good selection, the budget of which will be cut to finance the good in question. So far the literature has refrained from naming the alternative good. The generic “all other public goods” has instead been applied (Bergstrom et al 2004; Kontoleon et al 2005). Nunes and Traversi (2009) were the first to formally test how considering alternative government-funded goods in the reallocation scheme affects valuation. They applied a choice experiment in a high-income setting, Italy, to value a rail noise reduction program, where the two reallocation schemes considered were to reduce current public transport expenditure or reduce expenditure for the administration sector, respectively. While their results suggest that preferences are not sensitive to the source of financing, the authors acknowledge that results may be specific to the public goods considered in their study. Further investigation is thus in order.

In this paper, we argue that the insensitivity of stated preferences to the selection of the alternative public good in the reallocation task may fail when the experiment is conducted in developing and transitional economies. This may be due to a range of specific characteristics of these economies that can affect the valuation outcome (Teelucksingh and Nunes 2010; Mangham et al 2009). One such characteristic is the lower, compared to the major developed countries, income setting. Even under a tax reallocation scheme that does not exert any additional tax pressure on respondents, budget constraints and inability to cover basic material needs are likely to influence respondents' priorities with respect to different public goods. Furthermore, less developed countries are highly dependent to natural resources and extremely vulnerable to environmental degradation (Georgiou et al 1997; Barbier 2005; Narrain et al 2008). This is also likely to influence the priority local communities attach to environmental goods relative to other public goods. Moreover, the prevalence of corruption and informal economies in developing and transitional countries can affect valuation results especially when government-funded public goods are traded-off in the reallocation exercise. The lack of democratic tradition and the predominantly state-ownership of natural resources in the former socialist countries may also have implications for the valuation outcome.

A split-sample approach is thus followed in this study to formally test whether valuation estimates for marine restoration significantly differ under alternative financing options through the reallocation of existing government expenditures. Split-sample experiments are highly recommended when studies are administered in developing countries to gain insight on how respondents react to changes in the different elements of the valuation process as well as to assess the robustness of the

results when such changes are applied (Whittington 2002). The payment vehicle is no different. Specifically, the choice experiment scenario for half the sample proposed that marine restoration would be funded by reducing expenses in renewable energy projects, whereas for the other half, the restoration would be financed by public money currently spent on civil servants' training. In identifying which alternative public goods to employ in the reallocation scheme, effort was spent to include both a substitute environmental good that would imply a difficult trade-off for respondents, and a good that generated mixed feedback from focus groups regarding the rationale of being funded from government revenues that would imply a relatively easier trade-off.

Formal testing reveals that contrary to earlier findings (Nunes and Traversi 2009) preferences are affected by the budget source used to finance the programme suggesting that researchers should be very cautious in the selection of the alternative public goods in reallocation schemes. Although not manifested in the pre-survey focus groups, results also indicate that the training of civil servants exhibits public bad characteristics. That is, peoples' preferences are such that *ceteris paribus* redistribution is utility-enhancing. In the absence of a trade-off between tax revenues reallocation and the attributes of the programme in question, the valuation task is incapable of eliciting the monetary value people attach to these attributes. However, marginal rates of substitution are estimated for the non-price programme attributes. Results suggest that for the majority of the non-price attributes the marginal rate of substitution is also affected by the financing source. Finally, differences in the order of the effects between countries have been also revealed.

The paper is organized as follows. The next section presents the case study background and the design procedure. Section 3 introduces the research hypothesis, whereas Section 4 accommodates the results of the estimation and the hypothesis testing. Speculations on the determinants of results are offered in Section 5. Section 6 concludes the paper.

2. The Western Black Sea Valuation Study

2.1. Stating the problem

The Black Sea is among the largest inland water basins in the world that sustains a unique ecosystem, providing a variety of goods and services with value to humans (BSC 2008; Remoundou et al. 2009). Its ecosystem has witnessed dramatic change in the past three decades due to pressures from human activities and natural processes (ESF 2007; Heileman, Parr, and Volovik 2008; BSC 2009). The Black Sea is an almost entirely closed system, which has amplified the effects of climate change and anthropogenic forcing. Likewise, the benefits coastal populations derive from interaction with the marine environment have been reduced. Although there are signs of recovery mainly in response to the implementation of EU environmental policies, the state of the environment in the western shelf continues to be a matter of concern due to ongoing degradation. The waters of the Black Sea are increasingly less transparent, and beach closures due to insufficiently-treated sewage discharge problems have become regular. Nitrogen and phosphorus loading mainly from agricultural practices also affect water quality. Although there is evidence that nutrient concentrations are decreasing in the Black Sea, elevated concentration are

observed along the West Coast due to excessive nutrient input from the Danube (EEA 2000; ESF 2007; BSC 2009).

Meanwhile, marine pollution from the transportation of oil and other hazardous substances constitute a threat to public health. There are currently 28 pollution hotspots in the Western Black Sea associated with high pollution levels, presenting a risk of contamination from waterborne diseases (BSC 2009). Several incidents of cholera, *E. coli* outbreaks, and hepatitis A and enterovirus infections have been reported in the countries bordering the Western Shelf (BSC 2008). Moreover, marine mammals such as dolphins and monk seals are critically endangered and small pelagic fish stocks have declined due to overfishing and destructive fishing practices. Finally, alien species, especially the jellyfish *Mnemiopsis leidyi* introduced through uncontrolled deballasting from ships, are still a major cause of native biodiversity loss (BSC 2008). The rate of alien species invasion reached a peak in the 1980s and 1990s, but steadily continues today (ESF 2007).

Governments in the bordering states are beginning to recognize the need to sustainably manage their marine resources, and various national and international research and monitoring programs are currently being carried out in the Black Sea. Collaborative efforts under the auspices of international bodies such as the European Union have also been undertaken, which motivated the present case study³.

2.2. Data collection and experimental design

The choice experiment survey, which was administered to two random samples of residents in the western Turkish and Ukrainian Black Sea coasts, elicits public preferences towards different marine management policies both to improve water quality as well as biodiversity and reduce the risk of contracting water-related diseases in the Western Black Sea Shelf. The survey was pretested through face-to-face interviews over a week in early August 2009 in Turkey and late September 2009 in Ukraine. Data collection took place from August to October 2009 through personal interviews by trained local personnel. The survey administration resulted in the collection of 472 usable questionnaires, 312 in Ukraine and 160 in Turkey. Sampling areas are depicted in Figure 1. While a sample of this size is not sufficient to claim representativeness with regards to neither the Ukrainian nor the Turkish population, or to generalize the results for the whole Western Black Sea Shelf, it is adequate for the methodological purpose of this study.

[Figure 1 around here]

Feedback from focus groups and scientific evidence guided the selection of attributes and their potential levels under different management options. The employed attributes and their levels are presented in Table 1. Water quality was associated with water transparency as indicated by the color of the water and sight depth. Depending on the algae density, water quality can be high, medium or low. Biodiversity was defined as the number of different species and their abundance, again categorized as high, medium and low. Health risks were linked to the number of pollution hotspots associated with risk of contracting water-related diseases. Three levels were

identified; high, corresponding to the current situation with 28 pollution hotspots identified in the Western Black Sea; medium, with a decrease in pollution hotspots to 14; and low, with no pollution hotspots being identified in the area.

[Table 1 around here]

All levels corresponded to the situation that would prevail in the Black Sea ecosystem in 2030. Visual aids were also used to ease comprehension. An example of a choice card is provided in Figure 2. Photos and accompanying wording were carefully tested in the pilot survey to ensure respondents understood them clearly. The scenario presented the different policy measures that aimed to improve the level of each attribute in detail, to ensure that no correlation was perceived between the levels of the attributes. This was crucial, for otherwise respondents may have considered some combinations of the attribute levels as being implausible (Blamey et al. 2002). There was no indication of perceived causality during the pretesting.

[Figure 2 around here]

An orthogonal fractional factorial design was used to generate 32 choice sets, which were blocked in four versions for each split sample. Respondents thus looked at eight choice cards each, and were asked to state which profile they preferred among the two marine resource management options and a status-quo alternative. A cheap talk script first introduced the notion of hypothetical bias, and asked respondents to truthfully state their preferences keeping in mind the disposable tax revenues for the alternative public good (Cummings and Taylor 1998). A number of debriefing questions to identify protest behavior were also incorporated. In total three protestors were identified in the Renewable Energy sample and 12 in the Training for Civil Servants

sample, and excluded from the final sample. Serial non-participation significantly differs (p-value: 0.0198) in the two split samples with a higher proportion always selecting the status quo in the Training for Civil Servants sample (5%) compared to the Renewable Energy sample (1.28%).

A follow-up question asking respondents to rate their perceived level of difficulty to accomplish the choice task was included, given that people in the sampled regions were unfamiliar with surveys. Respondents who reported high levels of complexity were treated as outliers and were removed from the final sample. Complexity would likely encourage respondents to apply simplifying heuristics when making choices and consequently affect choice consistency or result in status quo bias (DeShazo and Fermo 2002; Dhar and Simpson 2003, Meyerhoff and Liebe 2009). In total, 15 respondents who found the task highly complex were excluded from subsequent analyses in the Renewable Energy and four in the Training for Civil Servants treatment. Excluding protestors and respondents who reported high-complexity for the choice task, 215 individuals remained in the Renewable Energy sample and 223 in the Training for Civil Servants sample.

The last part of the questionnaire ascertained respondents' socio-demographic information, such as gender, age, level of education and household income. Formal testing revealed the two splits were statistically equivalent in all socioeconomic characteristics. Thus, difference in preference across the two treatments, if established, can be ascribed to funding source. Table 2 reports the socioeconomic background of the respondents in the two samples.

[Table 2 around here]

3. Treatments and Hypotheses

The present valuation exercise employs a reallocation of the existing public budget as the payment vehicle. Bergstrom, Boyle, and Yabe (2004) were the first to introduce a reallocation scheme as an alternative to standard taxes in a contingent valuation study to value water quality. The authors developed the conceptual model and defined the notion of compensating tax reallocation (CTR) as the change in the provision of the other public good in the reallocation scheme that holds the utility constant, given a change in the provision of the public good in question. This is analogous to the compensating surplus under standard taxes. Formally, by using expenditure functions:

$$CTR = e(P, Q^0, Z^0, u^0) - e(P, Q^1, Z^1, u^0), \quad (1)$$

where e is the household expenditure required to attain the utility level u^0 , P is the price vector for the market goods, Q^0 and Z^0 are the initial levels of provision of the alternative public good and of the public good under valuation, respectively, Q^1 and Z^1 are the subsequent levels of provision after the reallocation, and u^0 is the utility associated with the initial level of provision of all public goods. Given that a tax reallocation scheme does not affect household's disposable income (e^*), and therefore $e^*(P, Q^0, Z^0, u^0) = e^*(P, Q^1, Z^1, u^0)$, Bergstrom, Boyle, and Yabe (2004) showed that:

$$CTR = e^*(P, Q^0, Z^0, u^0) + Z^0 - (e^*(P, Q^1, Z^1, u^0) + Z^1), \quad (2)$$

which reduces (2) to:

$$CTR = Z^0 - Z^1 . \quad (3)$$

Equation 3 therefore implies that in the realm of this framework, willingness to reallocate is the expenditure respondents are willing to forgo of the other public good in order to finance the good in question.

In line with this framework, the point of interest in this paper is to examine whether preferences are sensitive to the selection of the alternative public good in a tax reallocation scheme. To this end, two versions of the questionnaire were designed that differed only with respect to the public good whose budget would be reduced to finance the marine restoration program; these were renewable energy projects and training projects for civil servants. Several alternative public goods were considered and evaluated in focus groups with the general public. The final selection was based on the notion of proposing both an environmental and a non-environmental good, in order to examine their impact on the valuation of the attributes of the good in question. Since renewable energy and marine restoration may be considered substitutes from the perspective of environmental protection, the implied trade-off for respondents might be more difficult compared to when a non-environmental good such as training for public servants is employed. In particular, the idea of financing the proposed marine programme through reducing training expenditures for civil servants was welcomed by the majority of participants in the focus groups in both countries. The evidence that the trade-off was relatively easier in this case was further

confirmed by the very small and marginally significant coefficient of the payment attribute from the pretesting.

In both treatments, the scenario clarified that the European Union would coordinate the programme and guarantee compliance by the governments of all border nations. Coordination by an international organization was deemed necessary, since the high levels of corruption in both countries involved in the study, could have otherwise rendered the scenario unrealistic. Indeed, only 26% of the respondents in each treatment reported high confidence in the national government to implement the marine restoration programme (Table 2). However, the scenario employed was perceived as highly realistic by the majority (62% in the Renewable Energy treatment and the 68% in the Training for Public Servants).

The script depicting budget reductions in the renewable energy projects read as follows:

*To cover the cost of the marine restoration program described above, funds will be raised from the government purse in each country. In this case **no new taxes** will be introduced. Money will be reallocated to the marine program through a reduction in the 2010 budget on renewable energy without any further taxation. Therefore, this money will no longer be available for financing renewable energy projects that would contribute to the increase of the share of renewable energy in the total energy mix in the countries of the Western Black Sea.*

Respectively, the script explaining that part of the tax revenues currently being spent on training projects for public servants would be used to finance the marine program read as follows:

*To cover the cost of the marine restoration program described above, funds will be raised from the government purse in each country. In this case **no new taxes** will be introduced. Money will be reallocated to the marine program through a reduction in the 2010 budget on civil servant's training expenses in each country without any further taxation. Therefore, this money will no longer be available for financing training projects aiming at improving civil servants' skills and productivity and at making them work more efficiently and able to support citizens better.*

To ensure that respondents did not overlook the budget source when stating a choice, the payment vehicle in each choice card clearly stated the reallocation involved along with the monetary figure (see Figure 2).

Two hypotheses are examined to investigate whether funding source affects the value of the good in question. The first hypothesis claimed that the utility parameters vectors do not differ between the two treatments. Formally:

$$H_{01} : \beta_{RE} = \beta_{PST}$$

$$H_{11} : \beta_{RE} \neq \beta_{PST},$$

where the subscripts *RE* and *PST* on the coefficient vectors refer to the Renewable Energy and Training for Public Servants treatments, respectively. This is a joint hypothesis that all preferences for all attributes are equal in the two samples.

Next, the hypothesis that implicit prices for each attribute⁴, or WTP estimates are equal, was examined. Even if the equality of the whole vector of utility parameters between the two samples cannot (can) be rejected, it might be that for some attributes, preferences do (not) vary between treatments, while for others they do (not). Besides, information on implicit prices may be more useful to policy-makers in policy formulation.

4. Econometric Results and Welfare Estimations

4.1. Model specification

A Random Parameters Logit (RPL) model is used to analyze the choice data to allow for preference heterogeneity in the population. RPL models do not exhibit the strong assumption of independent and identically distributed error terms and its underlying behavioral assumption of independence of irrelevant alternatives of the standard multinomial logit model. Moreover, this specification allows the derivation of individual-specific estimates conditional on the observed individual choices.

Under a random parameters logit specification, the utility a respondent i derives from an alternative j in each choice situation t is given by:

$$U_{ijt} = \beta_i X_{jt} + e_{ijt},$$

where X is a vector of observed attributes associated with each alternative. and e_{ijt} is the random component of the utility that is assumed to be independently and identically distributed (iid) and follow a Type 1 extreme value distribution. The probability that an individual i will choose alternative j in choice situation t is:

$$\Pr_{ijt} = \int \left(\frac{\exp \beta_i X_{jt}}{\sum_k \exp \beta_i X_{kt}} \right) f(\beta) d\beta,$$

which is the integral of standard logit function over the distribution of random parameters, $f(\beta)$. Since this integral has no closed form, parameters are estimated through simulation and maximizing the simulated log-likelihood function. Parameter estimates in all models are generated using 100 Halton draws, and the random parameters are specified as random with normal distributions apart from the reallocation coefficient, which is specified as constant to allow for the calculation of the willingness-to-reallocate (Revelt and Train 1998; Train 2003). The assumption of normally-distributed random parameters allows different respondents to have positive or negative, in the presence of negative externalities, preferences towards the attributes of the good in question and is commonly adopted in the literature (Kataria 2009; Carlsson et al 2003).

4.2. Econometric estimation results

In the analysis that follows, data for each treatment are pooled from the two countries. Although countries are different in terms of the macroeconomic, cultural and political conditions, formal testing revealed that the pooled samples did not have statistically different socioeconomic characteristics. Differences in valuation may thus be

attributed only to funding source effect. However, to uncover the effects of the heterogeneity between the two considered countries on valuation in each treatment, a dummy variable indicating respondent's country of origin (with 1 corresponding to Ukraine) is also included in the models and is interacted with the tax reallocation coefficient.

4.2.1. Utility coefficients estimation

Table 3 accommodates the results of the random parameters estimation. In the renewable energy sample, all attributes have a significant effect on the choice of a marine restoration alternative, and the expected signs with positive coefficients for water quality, biodiversity and reduced health risk. Results suggest that reducing health risk from high to low was considered the most important attribute of the marine management alternative. The tax reallocation coefficient is negative and statistically significant, indicating that respondents are not willing to reallocate money from the renewable energy budget to finance the marine program *ceteris paribus*. The result is even more pronounced in the Ukraine sample, as implied by the negative coefficient of the interaction term.

[Table 3 around here]

In the training for public servants sample, all attributes are significant determinants of individual choice, with the exception of high biodiversity level. The coefficients are also positively signed, with high water quality influencing individual choice the most. The tax reallocation coefficient is positive and statistically significant, indicating that respondents are indeed willing, *ceteris paribus*, to reallocate money from the budget previously spent on training public servants to finance the marine program. This

implies that training for public servants exhibits features of a public bad and thus a reallocation of the tax revenues contributes positively to respondents' utility. The result is even more pronounced in Turkey, as implied by the negative coefficient of the interaction term.

4.2.2. WTP estimation and marginal rates of substitution

Since a fixed coefficient was specified for cost, the marginal WTP for changes in each attribute is calculated in the renewable energy sample as the ratio of the coefficient on each attribute to the coefficient on the monetary attribute:

$$WTP = -\frac{\beta_{attribute}}{\beta_{cost}}$$

Standard errors and the corresponding 95% confidence intervals are estimated using the bootstrap method proposed by Krinsky and Robb (1986). WTP estimates and relevant confidence intervals are presented in Table 4. Results suggest that WTP estimates are statistically significant for all the improvement over the status quo. Results further reveal sensitivity to scope, and therefore internal consistency, with higher levels of improvement being associated with higher WTP.

[Table 4 around here]

In the training for public servants treatment, WTP cannot be estimated since, by definition, WTP presupposes that there is a trade-off between the good in question and income (in this case, the provision of the alternative public good). However, marginal rates of substitution are estimated for the non-price attributes in both

samples to enable an examination of whether the relative ranking of individual attributes is affected by the choice of the alternative public good in the reallocation task. The medium water quality attribute is used as the *numéraire* (Table 5):

$$MRS = \frac{\beta_{attribute}}{\beta_{mediumwaterquality}}$$

[Table 5 around here]

Confidence intervals are estimated using the Krinsky-Robb method with 8,000 replications. In both treatments, respondents consider low health risks as the most important attribute followed by high water quality. There is a reversal in the ranking for the remaining attributes.

5. Effect of Funding Source on Valuation

5.1. Utility coefficients

Since utility coefficients are confounded with the scale parameter in Random Parameter Logit models, testing for equivalence of preferences across the two samples requires that scale parameter differences be isolated. To formally test for identical preferences and account for scale factor differences, the two-step procedure proposed by Swait and Louviere (1993) is followed. Accordingly, a likelihood ratio test is performed first to test for equality in the utility parameters between the two samples while allowing for the scale to differ; and if the equivalence of parameters cannot be rejected, a second likelihood ratio test assesses the equality of scale factors.

[Table 6 around here]

Regarding this study, the hypothesis of equal marginal utilities between the two samples can be rejected at 5% level of confidence with a test value of 140, implying that preferences differed significantly under different financing options through the reallocation of existing government spending (Table 6).

5.2. Relative ranking of the attributes

Since WTP estimations cannot be derived in the training for public servants sample, the marginal rate of substitution for each of the attributes is estimated using the medium water quality attribute as the *numéraire*. To formally examine whether or not the marginal rates of substitution are statistically different in the two treatments, the complete combinatorial test proposed by Poe et al (2005) is applied. This test calculates every possible difference between the two empirical distributions generated by the Krinsky-Robb procedure and calculates the proportion of negative values in the distribution of differences to approximate a one-sided p-value for the null of equality in the MRS across the two treatments. Results suggest that the null of equal MRS can be rejected for the majority (three out of five) of the considered attributes. Table 5 reports the relevant p-values. This is in accordance with the findings of the Swait-Louviere test confirming the dependence of preferences on funding source.

6. Discussion

When using a tax reallocation scheme to infer the value of a public good, researchers make the implicit key assumption that both goods are of value to respondents. This implies that respondents can substitute one for the other to choose utility-maximizing

alternatives. In this case study, monies reallocated from training for civil servants contribute positively to respondents' utility (*ceteris paribus*), implying that there is a welfare improvement when money from this budget is redirected to finance the marine restoration programme.

Closer examination of the public sector in the two countries offers insights as to what drives the positive coefficient in the reallocation attribute when civil servants' training is employed as the alternative public good. Both countries are characterized by inefficiently large public sectors, while widespread corruption among civil servants constitutes a significant barrier to any effort towards administrative reform and hinders the state's ability to respond adequately to citizens' needs. According to the *2010 Corruption Perceptions Index* prepared by Transparency International (2010a), an acknowledged authority on this issue, Turkey ranks 56st with a score of 4.4 (on an index from 0 to 10, 10 corresponding to no corruption at all and 0 to full corruption) and Ukraine 134th with a score of 2.4. With respect to the public sector, Transparency International's (2010b) *2009 Global Corruption Barometer* study found perceived corruption rate for public officers/civil servants to be 3.6 in Turkey and 4.5 in Ukraine on a scale of 1 to 5 (where 1 corresponds to not at all corrupt and 5 to extremely corrupt). Meanwhile, in both countries respondents of the 2009 Transparency International's *Global Corruption Barometer* named public officials and civil servants as those most affected by corruption compared to other sectors/organizations. These figures are revealing. A significant amount of respondents in both countries—28% of Ukrainian respondents and 35% of Turkish—perceived civil servants as being the most corrupt. This is reminiscent of the *2004 European Social Survey* findings where “trust in public officials to honestly deal with respondents” is very low especially in

Ukraine, where only 20.6% of the respondents declared being confident or highly confident in their government (ESS 2004). The relative figure in Turkey is 52%. This is a clear illustration of the low quality level that people attach to the public good denoted “civil services”.

Corruption, along with a long tradition of malfunctioning in the public sector, is likely to nurture the belief that “...any effort for further training will end up as a waste of resources,” as stated by a resident in Ukraine during the focus groups. Although one might expect that existing low quality public services would encourage people to opt for substantial reforms through the training of civil servants, it appears that low confidence in the government’s capacity to tackle corruption and efficiently implement reforms challenges the rationale of distributing money from the restricted public budget on training for civil servants. Consequently, reallocating the public budget previously spent on training for public servants—considered to be inherently corrupt—is a Pareto improvement, as indicated by the positive coefficient on the tax reallocation attribute in the training for civil servants treatment.

Although similar in direction, results appear to differ in magnitude for the two countries considered. Turkish people seem to perceive the reallocation of public money from the training budget for civil servants to the marine program as a Pareto improvement relatively more than their Ukrainian counterparts. This experiment is not conducive to making accurate recommendations as to what drives the differences in the magnitude of the sign between the two countries; nor is this intended. It is, however, contemplated that the obtained results are driven by cultural and political variables that shape people’s perceptions, but most importantly, by democratic

longevity. However fragile, democracy in Turkey dates back to 1950 and compared to Ukraine, which has been under the strict political bureau regime till recently, Turkey is able to question the balance between public and private, as well as the magnitude of resources allocated to the public sphere, more freely.

On the other hand, Ukrainian people seem to find it more difficult to trade-off money currently spent on renewable energy projects to finance the proposed marine programme. This is consistent with the answers in a relevant attitudinal question asking respondents to state their degree of agreement (in a 5 point Likert scale) with the statement “[r]enewable energy projects should be further enhanced in the West Black Sea region”. The 95% of the Ukrainian subsample supported the argument, which is a lot higher compared to 65% of the Turkish subsample (p-value: 0.00). Ukrainian people give relatively higher priority than the Turkish to renewable energy compared to marine restoration. We speculate that the difference in the magnitude of the coefficient is due to the fact that the share of renewable energy is higher in Turkey where renewables account for the 17.4% of the total electricity generation compared to Ukraine where only the 6% of the total energy mix is produced from renewable energy sources (International Energy Agency 2008). Turkey has explored its renewable energy potential, especially in the hydropower field, which alone accounts for the 16.8% of the total electricity produced (Renewable Development Initiative 2006a). On the other hand, Ukraine is yet to explore its considerable country’s capacity for renewable energy production, primarily hydropower and wind generation (Renewable Development Initiative 2006b). The major impediments to the growth of renewables are the high-risk economic conditions, the lack of financing and the extreme bureaucracy (Renewable Development Initiative 2006b). Consequently the country still relies on traditional energy sources and nuclear energy (46.7%) for

electricity (International Energy Agency 2008). This may explain why Ukrainian people support renewable energy production more than their Turkish counterparts and in turn trade-off renewable energy projects for marine restoration with greater difficulty.

7. Conclusions

A novel payment vehicle is used in this paper; a tax reallocation scheme under which the good in question was funded by existing tax revenues. Funding public goods out of existing revenues can be a promising valuation tool—particularly in low-income settings—capable of overcoming the problem of high protest responses often reported in relation to taxes, due to inability to pay and perceptions of inequality. Since, however, reallocation schemes have only recently been introduced in the stated-preference literature, validity issues have yet to be addressed before their widespread use can be supported with confidence. One such issue is the sensitivity of welfare estimates to the alternative public good that is traded-off in the reallocation scheme to finance the programme in question. We offer a test of validity, by examining the sensitivity of preferences to funding source, using data from a choice experiment implemented in Turkey, a developing country and Ukraine, an economy in transition, to value marine restoration. Two treatments are considered; in the first the restoration programme is to be financed by reducing current expenditures for renewable energy projects, whereas in the second, expenses for training of civil servants are to be decreased.

Results suggest that the choice of the alternative public good significantly affects the elicited preferences for the marine restoration programme. In particular, when the budget to be reallocated pertains to that for the training of civil servants, people choose, *ceteris paribus*, alternatives involving higher reallocation of the tax revenues. The reallocation is thus welfare-enhancing, implying that training for civil servants exhibits public bad features. Although such a design does not allow for the elicitation of welfare estimates in the second treatment, since for WTP to be estimated it is implicitly assumed that people may apply compensatory decision-making mechanisms, the marginal rates of substitution for non-price attributes can be estimated. Formal testing reveals that marginal rates of substitution are also sensitive to funding source for the majority of the considered attributes. Findings therefore suggest that researchers should be cautious when selecting the alternative public goods to be employed in a reallocation scheme since this may have implications for the valuation of the public good in question. Further, the results illustrate that the magnitude of the effect may differ from country to country. The interpretation of these differences is an interesting and policy-relevant area for further investigation.

The above conclusions are in contrast with the earlier findings of Nunes and Travisi (2009), who conducted a similar experiment in Italy, highlighting that generalization of the results drawn from experiments conducted in western developed economies cannot be proclaimed. The different social, cultural, economic and political characteristics of developing countries and countries with economies in transition are likely to have implications for the valuation outcome even when methodological issues are examined. However, since this is the first study applying a tax reallocation scheme in lower income countries more research is in order. Developing countries

and economies in transition are a very heterogeneous group and thus our results may well differ in different settings.

Finally, from a policy perspective results revealed that preferences in the case study areas are such that a welfare gain is associated with a decrease in the current budget for civil servants' training. Governments in Ukraine and Turkey can therefore attain a Pareto improvement by simply redistributing existing revenues without bringing any added tax pressure to citizens. Considering also the highly significant attributes of the marine restoration programme, it can be argued that there is high potential for sustainable marine resources management in the Western Black Sea under cooperation of the governments of the bordering states with international organizations such as the European Union.

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Tables

Table 1: Attributes and their Levels

Attribute	Definition	Levels
Water quality	Water transparency as indicated by sight depth	Low
		Medium
		High
Biodiversity	Number of different species and their abundance	Low
		Medium
		High
Public Health Risk	Number of pollution hotspots associated with risk of contracting water-related diseases	Low
		Medium
		High
Tax Reallocation	Reduction of the 2010 budget for projects on Renewable Energy / Training for Civil Servants	0 (status quo): money will not be reallocated
		20 euros
		50 euros
		80 euros
		100 euros

Table 2: Descriptive Statistics

Socioeconomics	Renewable Energy Sample	Training for Civil Servants Sample	P-value
Age	39.21 (14.67)	37.73 (15)	0.297
Gender (0=male,1=female)	0.41 (0.49)	0.60 (0.49)	0.5219
Household size	2.98 (1.36)	3.01 (1.47)	0.8244
Number of children	0.79 (0.96)	0.72 (0.62)	0.3672
Education (1=tertiary education and higher, 0=otherwise)	0.65 (0.47)	0.57 (0.49)	0.0819
Employment (1=in full time employment, 0=otherwise)	0.57 (0.50)	0.55 (0.50)	0.6756
Household income (€ per month)	502.16 (452.17)	471.83 (600.47)	0.5506
High realism of the scenario	0.62 (0.48)	0.68 (0.46)	0.1823
Confidence in government to undertake the marine restoration programme	0.26 (0.44)	0.26 (0.34)	1

Table 3: RPL Estimation Results

Attribute	Renewable Energy	Training for Civil Servants	Pooled Sample
	Parameter (St Error)		
Water Quality	1.448***	0.866***	1.063***
Medium	(0.125)	(0.099)	(0.074)
Water Quality High	1.484***	1.207***	1.315***
	(0.13)	(0.113)	(0.098)
Biodiversity	1.269***	0.752***	0.919***
Medium	(0.12)	(0.095)	(0.076)
Biodiversity High	1.273***	0.176	0.643***
	(0.133)	(0.114)	(0.087)
Health Risk Medium	1.104***	1.072***	1.090***
	(0.131)	(0.108)	(0.086)
Health Risk Low	1.857***	1.208***	1.43***
	(0.175)	(0.13)	(0.106)
Tax Reallocation	-0.008***	0.007***	-0.001
	(0.0023)	(0.002)	(0.002)
Tax Reallocation*	-0.006**	-0.005**	-0.004**
Country dummy	(0.0026)	(0.002)	(0.002)
Alternative Specific	-0.11	-0.285	-0.212*
Constant	(0.19)	(0.18)	(0.127)
Parameters standard deviation			
Water Quality	0.783***	0.655***	0.591***
Medium	(0.139)	(0.148)	(0.102)

Water Quality High	0.566** (0.232)	0.57241*** (0.220)	0.601** (0.266)
Biodiversity Medium	0.505*** (0.178)	0.555*** (0.149)	0.639*** (0.099)
Biodiversity High	0.285 (0.262)	0.897*** (0.165)	0.735*** (0.152)
Health Risk Medium	1.07*** (0.155)	0.029 (0.237)	0.572*** (0.144)
Health Risk Low	1.596*** (0.174)	0.864*** (0.164)	1.161*** (0.123)
Log likelihood	-1131.572	-1264.573	-2466.256

***Indicates significance at 1%, **Indicates significance at 5%, *Indicates significance at 10%.

Table 4: Willingness to Pay Estimates

Attribute	WTP estimate
High water quality	189.35 [106.16 370.39]
Medium water quality	185.75 [109.01 376.71]
High biodiversity	163.05 [92.53 324.97]
Medium biodiversity	162.07 [90.3 335.82]
Medium health risk	141.07 [79.41 285.04]
Low health risk	237.55 [136.87 473.08]

95% Confidence intervals calculated using the Krinsky-Robb method in brackets

Table 5: Marginal Rate of Substitution

Attribute	Renewable Energy		Training for Civil Servants		P-value Poe et al. test
	sample		sample		
	MRS	Rank	MRS	Rank	
Medium water quality	1.00000***	3	1.00000***	4	
High water quality	1.0245***	2	1.4012***	2	0.02
Medium biodiversity	0.8817***	5	0.8788***	5	0.479
High biodiversity	0.8822***	4	0.2052	6	0.000078
Medium health risk	0.7640***	6	1.2493***	3	0.00556
Low health risk	1.2891***	1	1.4097***	1	0.32

Table 6: Swait-Louviere Likelihood Test

Hypothesis	LR statistic	Test-Value	Critical Value for χ^2 statistic at 5%
$\beta_{renewableenergy} = \beta_{publicservants\&training}$	$LR = -2\{LL_{pooled} - (LL_{renewableenergy} + LL_{publicreform})\}$	140	16.93

Figure titles

Figure 1: Sampling areas (Ukraine: Sevastopol, Yalta, Odessa, Nikolaev, Eupatoria and Kherson. Turkey: Karaburun and Sile)

Figure 2: Example of a Choice Card

Footnotes

1. Adopted in June 2008, the Directive aims to effectively protect marine resources by achieving good environmental status for European marine waters by 2020. In this direction, member states are highly recommended to cooperate with non EU-countries within marine regions. The Black Sea region presents such an example.

2. The World Bank classification of countries according to gross national income (GNI) per capita is available at <http://data.worldbank.org/about/country-classifications/country-and-lending-groups>. Based on its GNI per capita, every country is classified as low-income, middle-income (subdivided into lower-middle and upper-middle), or high-income. Furthermore, according to the United Nations country grouping Turkey is a developing economy (sub-grouping: Asia and the Pacific) and Ukraine is an economy in transition from centrally planned to market economy (sub-grouping: Commonwealth of Independent States) (United Nations Statistics Division)

3. For initiatives at the regional and international levels, see the Black Sea Commission website (www.blacksea-commission.org) and the Black Sea NGO network website (www.bsnn.org). An extensive review is offered in the Black Sea Commission's report on the implementation of the Strategic Action Plan for the Rehabilitation and Protection of the Black Sea (BSC 2009).

4. Since all the three initial attributes are qualitative and take three discrete levels each, they were dummy-coded for the analysis and six attributes were thus generated.