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Is the Value of Environmental Goods Sensitive to the Source of Public Funding? Evidence from a Marine Restoration Programme in the Black Sea

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Abstract

In this paper we employ a choice experiment (conducted in Ukraine and Turkey) on the valuation of a marine restoration programme in the Black Sea, to examine whether the value of environmental goods is sensitive to the source of public financing. We contribute to the debate on the optimal composition of public expenditure, an issue that can be controversial in times of financial crises. We discriminate between two funding regimes through the reallocation of public spending. One proposes the financing of the marine restoration programme by reducing public expenditure for investments in renewable energy, and the second by reducing public expenditure for civil servants' training. The results reveal that the marginal value of public money depends on the funding source. In the civil servants' budget reallocation survey, the reallocation coefficient is positive, implying that *ceteris paribus* directing public resources away from this source is utility-enhancing. Furthermore, the valuation of the attributes of the marine restoration programme is sensitive to the trade-off implied by the funding scheme. The magnitude of the results differs in the two considered countries, mirroring their heterogeneity in political and cultural dimensions.

1. Introduction

Environmental conservation is at the core of policy agendas worldwide owing to increasing understanding of the significant contribution the natural environment has on human well-being. Investment in environmental protection requires significant resources. Given the constraints on governments' budgets, especially in the case of middle- and low-income countries, the optimal allocation of public spending between competing goals of environmental improvement and other valuable pubic goods requires knowledge of public preferences for the different components of government expenditures. This knowledge can facilitate priority-setting and inform the reallocation of public spending towards more desirable goods, a need more urgent in times of financial crises (Lopez et al. 2011).

In this paper we contribute to the debate on the optimal composition of public spending, by examining people's preferences for marine restoration in the Western Black Sea shelf and potential funding sources. The Black Sea ecosystem has witnessed dramatic change over recent decades due to pressures from human activities and natural processes (ESF 2007; Heileman et al. 2008; BSC 2009; Remoundou et al. 2009). 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. Problems relate to increasingly less transparent waters due to nutrient concentrations, pollution from the transportation of oil and other hazardous substances and alien species invasions. To assess preferences, we conducted a choice experiment in the costal settlements of Turkey and Ukraine, two middle income countries[1], and used a tax

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[1] 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-

reallocation scheme as the payment vehicle to raise the funds for the provision of the proposed good. We follow a split-sample approach; the scenario for one sample proposed that the marine restoration would be funded by reducing public spending for renewable energy generation, while for the second sample, the restoration would be financed by public money currently spent on civil servants' training. There are extensive public debates on the rationale and extent of public financing for these goods in both countries. Given the middle-income country setting of our study, a tax reallocation scheme could circumvent high zero WTP responses resulting from respondents' inability to pay due to budget constraints as well as high protest responses associated with feelings of unfairness when additional tax loads are charged to low income people (Bennett and Birol 2010). High zero and protest responses were reported in a recent contingent valuation study in Turkey (Adaman et al. 2011).

Using two alternative public goods, the aim of this study is to examine the relative value of the different components of government spending. We first test whether reducing current expenditure for renewable energy and civil servant training has the same effect on individual utility by comparing the coefficients on the monetary attribute in the utility model. We further examine whether the relative value of the marine project's attributes is sensitive to the funding source; we therefore test for the equality of the Marginal Rate of Substitution between the attributes of the project in the two treatments. Differences in the values for the projects' attributes in the two treatments, would indicate that contextual issues in the valuation protocol, here related with the payment conditions, influence preferences for

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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 2010)

environmental goods and services. The second hypothesis therefore relates to a wider literature on context- dependent preferences (Kragt 2013, Luisetti et al. 2011).

Tax reallocation schemes were first introduced by Bergstrom et al. (2004) and further applied by Kontoleon et al. (2005), Morisson and Mc Donald (2012) and Swallow and McGonagle (2006). The focus of these studies is on comparing welfare measures under standard taxes and tax reallocations. Comparisons between reallocation schemes that suggest different public spending sources have received less attention. Similar to our study, Nunes and Travisi (2009) applied a stated choice experiment, considering a transport tax reallocation scheme and an administration tax reallocation scheme as the payment vehicle. The authors compared the values for the good under the two payment regimes and found no difference.

Contrary to previous studies, we examine the hypotheses in two middle-income economies. Although a tax reallocation scheme 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 on the natural resources and 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 may affect the valuation results especially when government-funded public goods are traded-off in the reallocation exercise. Finally, the lack of democratic tradition along with the dominant role of the state in the ownership of natural resources in former socialist countries may impact on the ability of people to question the balance between resources allocated to environmental and other public goods. Furthermore, citizens in countries with short democratic history have

substantially less experience expressing their preferences for public policy issues which may complicate their decision-making.

We find a positive reallocation coefficient in the utility model in the training of civil servants treatment in both countries, suggesting that *ceteris paribus* redistribution is utility-increasing. Furthermore, in both countries the marginal rates of substitution between the non-monetary attributes of the marine restoration project are found to differ between treatments suggesting that values are sensitive to the financing source.

2. The Western Black Sea Choice Experiment

2.1. Experimental design and data collection

The selection of attributes and their levels under different management options was guided by feedback from two focus groups, one with the general public and the second with natural scientists, both held at the National Academy of Sciences of Ukraine, as well as scientific evidence from background reports (BSC 2009) and discussions with marine biologists, experts on the Black Sea marine environment[2]. The attributes and their levels are presented in Table 1. Water quality was associated with water transparency approximated by water color and sight depth. Depending on algae density, water quality could be high (corresponding to 1.5m of visibility depth), medium (corresponding to the current situation of 1m of visibility

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[2] In particular, the survey was developed in collaboration with scientists working in the Sesame FP6 project, which is an integrated programme assessing and predicting changes in the Mediterranean and Black Sea ecosystems due to climate change. Marine biologists also reviewed the final survey information to ensure accuracy.

depth), or low (corresponding to the situation under no policy intervention which would be 0.2 m of visibility depth). Biodiversity was defined as the number of different species and their abundance, categorized as high, medium, and low. Depending on the degree of intervention, the current abundance of marine habitats could be sustained (medium biodiversity level) or could be increased, through the restoration of damaged areas of previously high biodiversity, to a level that can ensure the stability of the ecosystem (high biodiversity level). Respondents were further informed that in the absence of any action many endangered species would cease to exist in the next twenty years (low biodiversity level). 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, involving a decrease in pollution hotspots to 14; and low, implying that no pollution hotspots are identified in the area.

[Table 1 around here]

All levels referred to the situation that would prevail in the Black Sea ecosystem in 2030. Visual aids were also used to ease comprehension. For the water quality attribute, the pictures depicting different water-colour shadings to communicate the depth of the visibility in the water were adapted from Taylor and Longo (2010). We further developed pictures for the other attributes. Figure 1 gives an example of a choice card. Photos and accompanying wording were carefully pre-tested to ensure respondents understood them clearly.

[Figure 1 around here]

An orthogonal fractional factorial design was used to generate 32 choice sets, which were blocked in four versions for each split sample. A cyclical design procedure (fold-over design) was followed to avoid strictly dominated alternatives (Carlsson and Martinsson 2003).

Respondents thus looked at eight choice cards each, and were asked to state which profile they preferred among the two marine ecosystem 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 (Carlsson et al., 2007). A number of debriefing questions to identify protest behavior were also incorporated.

The last part of the survey ascertained respondents' socio-demographic information, such as gender, age, the level of education and household income.

Our stated choice experiment survey was administered to two random samples of residents in the western Turkish and Ukrainian Black Sea coasts. The survey was pretested through face-to-face interviews over a week in early August 2009 in Turkey (Istanbul) and late September 2009 in Ukraine (Donetsk). Refinements to the original survey were made accordingly. Data collection took place from August to October 2009 through personal interviews by trained local personnel. In Ukraine, interviewers' training (all of them scientists working with the Ukrainian National Academy of Sciences) took place over a two-day seminar in the National Academy of Sciences in Donetsk by one of the authors. The surveys for both treatments were identical in the two countries in all other aspects but the currency in which the monetary attribute was stated (Turkish Liras and Hryvnia in Turkey and Ukraine respectively) and the country whose government budget would be reduced (Turkish and Ukrainian budget respectively). The original surveys were written in English. One of the authors translated the surveys in Turkish. The surveys were translated in Ukrainian by one of the project partners, while both translations were double checked by native speakers participating in the project. In Turkey, data collection was performed by one of the authors and a trained assistant.

The survey administration resulted in the collection of 472 usable questionnaires, 312 in Ukraine and 160 in Turkey. Sampling areas are depicted, with dots, in Figure 2. In Ukraine, six large cities (Sevastopol, Yalta, Odessa, Nikolaev, Eupatoria and Kherson) surrounding the West Black Sea were selected. Interviewers were instructed to randomly approach one every ten people in the High Street of each city. If the selected person declined to participate then the next one was selected and enumerators counted again the tenth person thereafter. In Turkey, interviews took place in two villages around Istanbul at the Turkish West Black Sea coast (namely Karaburun on the west of Istanbul and Şile on the east of Istanbul). In both countries we opted for sampling areas on the west coast of the Black Sea that are engaged in tourism and fisheries. A marine restoration project would therefore be valuable to the local populations. The smaller size of the Turkish villages allowed interviews to take place at home. Interviewers randomly selected 8 streets (weighted by the number of houses) and with the help of a random number generator selected ten houses from each street. If the house selected did not respond for two consecutive visits, interviewers replaced that house with another one (again randomly selected). The response rate was 88% in Turkey and 65% in Ukraine.

The sample and geographical coverage of this size is not sufficient to claim representativeness with either the Ukrainian or the Turkish population, or to generalize the results for the whole Western Black Sea Shelf. However, it is adequate to examine our research hypotheses.

[Figure 2 around here]

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2.2 Treatments

We designed two versions of the questionnaire that differed only with respect to the public good whose budget would be reduced to finance the marine restoration programme; these were renewable energy projects and training projects for civil servants. The scenario stressed that in order to cover the cost for the marine restoration project no new taxes would be introduced and the funds would be raised through reduction of the 2010 public budget on renewable energy and civil servants' training respectively (the exact text is provided in the appendix).

Other public goods were considered and evaluated in focus groups with the general public. These were public health, education and transportation. All were seen as very important and any suggestion to reduce funds for these goods (even if reductions would finance other public goods/services) attracted a very strong resistance. Concerns for high protest response rates precluded their consideration as alternative public goods. We concluded to renewable energy and civil servants' training since there is an active debate on the amounts of public funds directed to these goods in both countries. Furthermore, focus groups confirmed that people are aware of their contributions for these goods through income tax and indirect taxes, despite the fact that no specific tax receipts are earmarked for spending on these goods. The trade-offs that the experiment involves were thus meaningful and plausible.

Public funds are devoted to training activities aiming to enhance the quality of the provided public services in both countries (Acar and Ozgur 2004; International Commission of Independent Experts 2010). For Turkey in particular, such activities are required given the country's bid to join the European Union. Likewise, in Ukraine civil servants' training has

been a central feature in the government's policy given Ukraine's highly centralized and hierarchical bureaucratic tradition inherited from the communist institutions of the Soviet Union[3]. The public sector is undergoing continuous transformations and reforms, requiring training and re-skilling of public servants. At the same time, both countries have high renewable energy potential and significant amounts have been directed in renewable energy investments either directly or through incentives in the form of feed-in tariffs and subsidies. In Turkey renewables account for the 17.4% of the total electricity generation and the governments' strategy is to increase the share of renewable energy to 30% of total energy consumption by 2023. In Ukraine only 6% of the total energy mix is produced from renewable energy sources but the State aims for a 20% share of renewable energy by 2020 (International Energy Agency 2008).

In both treatments, the scenario clarified that the European Union would coordinate the programme and guarantee compliance by the governments of all neighboring states. 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, confidence in the national government to implement the marine restoration programme is found low in both countries (Table 2). However, the scenario employed was perceived as highly realistic by the majority (Table 2). To ensure that respondents did not overlook the budget source when stating a choice, the payment vehicle in

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[3] In Turkey training is delivered through the Ministry of National Education and the 'Public Administration Institute for Turkey and the Middle East'. Acar and Ozgur (2004) provide an overview of the main policies and institutions associated with training for civil servants in Turkey and discuss challenges in developing effective training policies and practices. In Ukraine training for civil servants is mainly provided by the National Academy of Public Administration along with its four regional offices and 27 local centres, and a number of Higher Education Institutes. Traditional methods of public service training revolve around taught courses but their effectiveness is often questioned. Open and distance learning technologies can offer a viable alternative but would require an increase in public spending for training.

each choice card clearly stated the reallocation involved along with the monetary figure (see Figure 2).

3. Hypotheses and Econometric model

Bergstrom et al. (2004) were the first to introduce a reallocation scheme as the payment vehicle in a non-market valuation study. The authors developed the conceptual model and defined Willingness to Reallocate (WTR) as the change in the provision of the other public good in the reallocation scheme that keeps utility constant, given a change in the provision of the public good in question. This is analogous to WTP under standard taxes with the difference that the cost is now defined in terms of the provided quantity of the other pubic good and not in disposable income terms. Therefore, Willingness to Reallocate (WTR) can be defined as the Marginal Rate of Substitution (MRS) between the good under evaluation and the alternative public good whose budget is to be reduced. Similarly, a Willingness to Accept compensation (WTA) measure can be defined in this context as the minimum provision of the other public good that the person would be willing to accept as compensation to keep utility constant given a decrease in the provision of the public good under investigation. Bergstrom et al. (2004) further derive the conditions under which the two measures (WTR and WTP) are equivalent. They explain that this depends on the relative value of disposable income compared to quantities of the alternative good; when the MRS between the attributes of the good and tax (disposable income) equals the MRS between the attributes of the good and the quantity of the alternative public good, WTP and WTR should be equal. In other words the two measures are equal when an individual is indifferent between an increase in disposable income and an increase in the quantity of the alternative public good.

Within this framework, the points of interest in this paper are: (1) to examine whether the marginal disutility of reallocating public money depends on the budget source

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

and (2) to examine whether marginal values (in terms of the MRS) for the non-price attributes of the good under evaluation are sensitive to the selection of the alternative public good in a tax reallocation scheme.

$$H_{02} : MRS_{RE_i} = MRS_{PST_I}$$

where the subscripts *RE* and *PST* on the coefficient vectors refer to the Renewable Energy and Public Servants' Training treatments, respectively. The first hypothesis is thus aimed to provide insights on the relative value of the two public goods considered. The second hypothesis examines whether values are sensitive to a contextual characteristic (the source of public funding) of the valuation scenario. This relates to the discussion on preference formation in stated choice studies and the sensitivity of values to contextual elements of the valuation scenario (Kragt 2013, Luisetti et al. 2011). Contextual influences are usually attributed to respondent's lack of experience with pricing environmental goods as well as the demanding nature of the valuation task. By changing the funding source we change the valuation context. Contextual influences are likely to be in order, manifested by changes in the relative value of the attributes of the good in the two treatments. Previous research has found significant contextual influences relating to the description of the good's attributes, the wording of the valuation scenario and the scope and timing of the policy change (Czajkowski and Hanley 2009, Bond et al. 2009).

To account for preference heterogeneity, a Random Parameters Logit (RPL) model is used to analyze the stated choice data (Hensher and Greene 2003). Under an RPL specification the stochastic component of the utility is segmented into two parts; one part is correlated over

alternatives and heteroskedastic over individuals and alternatives, and the other part is independently and identically distributed (iid) over alternatives and individuals. Individual-specific parameter estimates can be derived given the observed individual choices.

Parameter estimates in all models are generated using 100 Halton draws (Bhat2001). Attributes' parameters are assumed to be normally distributed. The assumption of normally-distributed random parameters allows respondents to have positive or negative preferences towards the attributes of the good and is commonly adopted in the literature (Kataria 2009; Lew and Wallmo 2011; Olsen et al. 2011). Since the reallocation coefficient enters the denominator of the WTR, we assume a constant marginal utility for this attribute to assure finite moments for the WTR distribution (Lew and Wallmo 2011; Olsen et al. 2011).

A Swait-Louviere (Swait and Louviere 1993) test for the equality of the utility coefficients in the two treatments rejected the possibility to pool data for each treatment from the two countries. Therefore, we present the results of the hypothesis testing for each country separately. Furthermore, although the biodiversity attribute originally had three levels, a Poe et al (2005) test for internal scope sensitivity indicated insignificant differences for the medium and high level which are pooled. One dummy variable (biodiversity high) is therefore used in the analysis that follows. The variable for health risks is continuously coded and framed as reduction in the number of pollution hotspots in the analysis. Therefore a positive sign is expected and values are expressed per pollution hot spot.

4. Econometric Results

4.1 Protest responses and Descriptive statistics

Given replies in the debriefing statements, in total nine protestors were identified in Turkey (5.6% of the sample) and six in Ukraine (1.9% of the sample), and excluded from the final sample. We further asked respondents to rate their perceived level of complexity of the choice task. Complexity may encourage respondents to apply simplifying heuristics when making choices and consequently may affect the consistency of their choices (DeShazo and Fermo 2002; Dhar and Simpson 2003; Meyerhoff and Liebe 2009). Respondents who reported high levels of complexity (replying 4 or 5 in a 1 to 5 Likert-scale) were removed from the final sample to provide more consistent estimates. In total, 18 respondents who found the task highly complex were excluded from the subsequent analysis in Ukraine and one in the Turkey. However, results do not change substantially when respondents perceiving the task as highly complex are kept in the sample. Excluding protestors and respondents who reported high-complexity for the choice task, 288 individuals remained in Ukraine (141 in the Renewable Energy treatment and 147 in the Training for Civil Servants treatment) and 150 in Turkey (74 in the Renewable Energy treatment and 76 in the Training for Civil Servants treatment).

Table 2 reports the socioeconomic background of respondents in the two treatments in each country. The first two columns refer to Ukraine while the last two to Turkey. For both countries testing revealed that the samples in the two treatments were statistically equivalent in all socioeconomic characteristics. Thus, differences in the preference structure and valuation across the two treatments, if established, can be ascribed to funding source and not to differences in the socio-economic profile of respondents. Since the focus of the analysis is the comparison between treatments in each country, we do not test for the equality of the

socioeconomic characteristics between countries. However, differences are evident most notably with regards to income and education.

[Table 2 around here]

4.2. Utility coefficients estimation

Table 3 presents the results of the random parameter models estimation. The first two columns refer to Ukraine while the last two to Turkey. In the renewable energy sample for both countries, 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 reduction of pollution hot spots associated with health risks. The tax reallocation coefficient is negative and statistically significant, indicating that respondents are less likely to select alternatives requiring higher reallocation from the renewable energy budget to finance the marine programme *ceteris paribus*.

[Table 3 around here]

Likewise, in the training for public servants sample in both countries, all attributes are significant and positive determinants of individual choice. Contrary to the previous treatment, the tax reallocation coefficient is positive and statistically significant, indicating that respondents are *ceteris paribus* willing to reallocate money from the budget previously spent on training public servants to finance the marine programme. This implies that a reallocation of the tax revenues from training for public servants contributes positively to respondents' utility.

Finally the negative Alternative Specific Constant (ASC) coefficient on the opt-out alternative suggests that respondents desire to move away from the status quo and in principle favour a restoration program. This is so since we specify the ASC as the utility of the status quo alternative (Scarpa et al. 2005). Note that the ASC is not statistically significant in Turkey.

4.3 WTR estimation and Marginal Rates of Substitution

The marginal WTR for changes in each attribute is calculated in the renewable energy treatment for each country as the ratio of the coefficient on each attribute to the coefficient on the monetary attribute (assuming linearity in utility parameters):

$$WTR = -\frac{\beta_{attribute}}{\beta_{\cos t}}$$

Standard errors are estimated using the bootstrap method proposed by Krinsky and Robb (1986). WTR estimates for the two countries are presented in Table 4. Results suggest that WTR estimates are statistically significant for all the improvements over the status quo. WTR figures are relatively higher in Turkey reflecting the higher mean income and thus the higher mean income tax.

[Table 4 around here]

In the training for public servants treatments, WTR cannot be estimated since, by definition, WTR presupposes a trade-off between the good in question and income (in this case, the provision of the alternative public good). Nevertheless, we estimate the marginal rates of substitution for the non-price attributes in both treatments to enable the examination of whether or not the relative value of the 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).

[Table 5 around here]

Standard errors of the MRS are estimated using the Krinsky-Robb method with 8,000 replications. Results suggest that all MRS estimates are statistically significant in 95% level of confidence for both treatments in both countries.

4.4 Effects of funding source on valuation

To 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 computes 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 high water quality attribute in both countries. Table 5 reports the relevant *p*-values. Our findings therefore illustrate that the MRS estimates between the attributes of a given public good may be affected by the funding mechanism applied for their provision.

5. Discussion

Results suggest that reallocating money currently spent on renewable energy projects to finance the proposed marine programme involves a real trade-off to respondents who, *ceteris paribus*, prefer lower levels of reallocation. This is consistent with the answers in a relevant

attitudinal question asking respondents to state their degree of agreement with the statement "[r]enewable energy projects should be further enhanced in the Western Black Sea region". 95% of the Ukrainian and 61% of the Turkish samples supported the argument which shows respondents' awareness of the need to further exploit the considerable capacity for renewable energy production that both countries possess.

On the other hand, reallocating money away from civil servants' training contributes positively to respondents' utility (*ceteris paribus*), implying a welfare improvement when part of 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[4]. Corruption, along with a long tradition of inefficiency 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 our focus groups.

The positive reallocation coefficient could also result from a protest attitude of respondents who may select a high reallocation alternative as a means of punishment against public servants. To examine whether there are indications of protest attitude in our sample we calculate the share of respondents that always select the option involving the highest

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[4] According to the 2010 Corruption Perceptions Index prepared by Transparency International (2010a), Turkey ranks 56st with a score of 4.4 (on an index from 0 to 10, with 10 corresponding to no corruption at all and 0 to full corruption) and Ukraine 134th with a score of 2.4. Furthermore, Transparency International's (2010b) 2009 Global Corruption Barometer study reports a perceived corruption rate for public officers/civil servants of 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). In both countries respondents named public officials and civil servants as those most affected by corruption compared to other sectors.

reallocation. We find that only 7% in Ukraine and 1.3% in Turkey systematically chose the highest reallocation alternative. The low shares suggest that protest behaviour was not prevalent in our sample. Nevertheless, we cannot completely exclude the possibility that protest attitudes motivated some of the respondents.

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 an 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 the sample size and geographical coverage of our sample adequate to allow us to generalize the results for the two countries. It is possible that the 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 until 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. We speculate that the difference in the magnitude of the coefficient is due to the fact that Turkey has explored its renewable energy potential relatively more. This is particularly true for the hydropower field, which alone accounts for the 16.8% of the total electricity produced (Renewable Development Initiative 2006). On the other hand, Ukraine's current energy production from renewable sources is far below its potential and the country still relies on traditional energy sources and nuclear energy (46.7%) for heat and electricity (International Energy Agency 2008). Consequently, the opportunity cost of reallocating money from

renewable energy is higher for Ukrainians. This is also evident by the high percentage (95% against 61% in Turkey) declaring in favor of enhancing renewable energy projects (Table 2). Results further reveal that the MRS for one of the considered attributes differs in the two treatments, in both countries, implying that the value of the good's attributes may be sensitive to the financing context that frames its provision. Our results may corroborate earlier findings suggesting that values are sensitive to the framing of the decision context. Close to our finding, Carlsson et al. (2009) find different preferences for the attributes of the good in the presence or absence of a price and relate this to people paying greater attention at the attributes of the good when price is not in the attributes list. We cannot exclude the possibility that people concentrate more on the attributes of the marine restoration project when a public good that they are not interested in is traded-off.

6. Conclusions

In this paper we employ a stated choice experiment and adopt a tax reallocation scheme as the payment vehicle. We consider two reallocation schemes to finance a marine restoration programme; in the first restoration is financed through a reduction in the current public expenditures for renewable energy projects, whereas in the second, by a reduction in current public expenditure for civil servants' training. The experiment is implemented in Turkey, a middle income country, and Ukraine, an economy in transition. By employing two reallocation schemes, we examine whether the disutility of reducing the public budget differs among public goods and whether the value of the attributes of the environmental good under evaluation is sensitive to the source of public funding.

Our results suggest that the definition of the alternative good significantly affects valuation. In the treatment suggesting a reallocation from renewable energy, a trade-off between goods is present as indicated by the negative coefficient on the reallocation attribute. This is equivalent to the negative monetary coefficient when new taxes are employed as the payment vehicle. However, 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.

We further find that the value, in terms of MRS, of the considered attributes differs in the two treatments implying that the value of good's attributes may be sensitive to the financing context that frames its provision. Our results therefore suggest that contextual influences may also be present when there is a change in the framing of the payment regime.

Tax reallocations can be a promising payment vehicle for stated preference studies. Our study revealed that due care should be given to the selection of the funding source. Goods that are policy relevant and meaningful to respondents should be chosen so that the simulated decision environment matches as much as possible to the real policy context that frames the provision of the good in question (Payne et al 1992). Nevertheless, future research should examine whether our conclusions hold when other public goods are considered and how, for example, the degree of substitutability between the good under evaluation and the alternative good may affect the results. Furthermore, culture as well as the different political economy and institutional settings of different countries may influence the conclusions.

Finally, from an applied policy perspective, results reveal that respondents are willing to redirect money to the introduction of a marine protection programme in order to reduce the

level of public health risk and improve the overall level of water quality and marine biodiversity, here measured in terms of the abundance of different marine species. Our results thus point to high potential for sustainable marine resources management. However, extrapolations for the whole Western Shelf are not intended given the small, relatively to the area, and not geographically representative sample size.

7. Acknowledgements

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9. Figure Captions

Fig. 1 Example of a Choice Card

Fig. 2 Sampling areas (Ukraine: Sevastopol, Yalta, Odessa, Nikolaev, Eupatoria and Kherson. Turkey: Karaburun and Sile)

10. Tables

Table 1: Attributes and their Levels

Attribute	Definition	Levels
Water quality	Water transparency as indicated by sight depth	Low (status quo [a]): 0.2 m of visibility depth Medium: 1m of visibility depth High: 1.5m of visibility depth
Biodiversity	Number of different species and their abundance	Low (status quo) Medium High
Public Health Risk	Number of pollution hotspots associated with risk of contracting water-related diseases	High: 28 pollution hot spots (status quo) Medium: 14 pollution hot spots Low: 0 pollution hot spots
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 Euro 50 Euro 80 Euro 100 Euro

[a] The status quo alternative refers to the expected situation in the Western Black Sea in 2030 under no policy intervention

Table 2: Descriptive Statistics

Socioeconomics	Ukraine			Turkey		
	Renewable Energy	Training for Civil Servants	P-value	Renewable Energy	Training for Civil Servants	P-value
Age	39.20 (14.8)	36.33 (14.28)	0.10	39.20 (14.5)	41.88 (14.76)	0.27
Gender [a]	0.40 (0.49)	0.40 (0.49)	0.90	0.43 (0.50)	0.53 (0.50)	0.22
Household size	2.60 (1.04)	2.73 (1.50)	0.39	3.73 (1.6)	3.61 (1.23)	0.62
Number of children	0.64 (0.77)	0.56 (0.88)	0.71	1.10 (1.18)	1.04 (1.06)	0.71
Education [b]	0.72 (0.45)	0.68 (0.47)	0.56	0.22 (0.41)	0.23 (0.42)	0.88
Employment [c]	0.62 (0.49)	0.56 (0.50)	0.25	0.46 (0.50)	0.55 (0.50)	0.29
Household income (€/month)	367.9 (288.1)	312.5 (493.83)	0.304	1531.2 (1308.5)	1560.7 (1390.9)	0.90
High realism of the scenario	0.54 (0.50)	0.63 (0.48)	0.11	0.78 (0.41)	0.78 (0.41)	0.97
Confidence in government to undertake the marine restoration programme	0.27 (0.44)	0.31 (0.46)	0.42	0.26 (0.44)	0.17 (0.38)	0.22
I believe that public spending for renewable energy should be enhanced	0.96 (0.19)	-	-	0.61 (0.49)	-	-

[a] 0=male, 1=female;
[b] 1=tertiary education and higher, 0=otherwise;
[c] 1=in full time employment, 0=otherwise.

Table 3: RPL Estimation Results

Attribute	Ukraine		Turkey	
	Renewable Energy	Public Servants' Training	Renewable Energy	Public Servants' Training
	Parameter (St Error)			
Water Quality Medium	1.42*** (0.15)	0.67*** (0.11)	1.47*** (0.22)	1.57*** (0.23)
Water Quality High	1.55*** (0.16)	0.96*** (0.11)	1.76*** (0.26)	2.73*** (0.46)
Biodiversity High	1.34*** (0.14)	0.44*** (0.09)	1.23*** (0.26)	1.01*** (0.22)
Reduction of health Risk	0.07*** (0.01)	0.04*** (0.01)	0.08*** (0.01)	0.07*** (0.01)
Tax Reallocation	-0.019*** (0.003)	0.003** (0.002)	-0.008** (0.003)	0.007* (0.003)
Alternative Specific Constant	-0.65*** (0.23)	-0.53*** (0.19)	-0.37 (0.35)	-0.30 (0.39)
Parameters standard deviation				
Water Quality Medium	0.67*** (0.18)	0.56*** (0.16)	0.88*** (0.29)	0.84*** (0.29)
Water Quality High	0.66*** (0.26)	0.004 (0.19)	1.05** (0.36)	2.85*** (0.51)
Biodiversity High	0.55** (0.16)	0.29 (0.21)	1.64*** (0.27)	0.96*** (0.24)
Reduction of health Risk	0.06*** (0.01)	0.04*** (0.01)	0.10*** (0.01)	0.07*** (0.02)
Log likelihood	-712.45	-909.53	-368.76	-335.30

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

Table 4: Willingness To Reallocate Estimates (for the Renewable energy survey)

Attribute	Ukraine	Turkey
	WTR estimate (euros)	
Medium water quality	74 [55.18 99.43]	314.67 [88.31 745.02]
High water quality	81 [60.78 107.91]	408.98 [109.66 888.96]
High biodiversity	69.79 [53.62 91.06]	271.42 [69.83 614.94]
Reduction of health risk (per pollution hot spot)	3.66 [2.74 4.80]	18.92 [4.83 39.99]

Note: 95% Confidence intervals calculated using the Krinsky-Robb method in parentheses

Table 5: Marginal Rates of Substitution

Attribute	Ukraine			Turkey		
	Renewable Energy	Training for Civil Servants	P-value Poe et al. test	Renewable Energy	Training for Civil Servants	P-value Poe et al. test
Medium water quality	1.00	1.00	-	1.00	1.00	-
High water quality	1.1 [0.88 1.35]	1.46 [1.07 1.97]	0.065	1.22 [0.87 1.62]	1.76 [1.23 2.40]	0.062
High biodiversity	0.95 [0.73 1.22]	0.68 [0.38 1.11]	0.110	0.85 [0.47 1.33]	0.65 [0.36 0.99]	0.220
Reduction of health risk	0.05 [0.04 0.06]	0.06 [0.04 0.09]	0.137	0.06 [0.04 0.08]	0.04 [0.03 0.06]	0.172

Note: 95% Confidence intervals calculated using the Krinsky-Robb method in parentheses

Appendix:

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 Ukraine [Turkey]. In this case **no new taxes** will be introduced. Money will be reallocated to the marine program through a reduction in the 2010 public 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 Ukraine [Turkey]. In this case **no new taxes** will be introduced. Money will be reallocated to the marine program through a reduction in the 2010 public budget on civil servants' training expenses 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.*